

The Electragist

TRADE MARK REG. U.S. PAT. OFFICE

Vol. 24, No. 10

Association of Electragists
INTERNATIONAL

AUGUST, 1925

"SALES EASY—PROFITS SURE" declare 134 "Red Spot" Jobbers

134 Leading electrical supply jobbers
now recommend and sell "Red
Spot" Hangers

Easy sales, sure profits, satisfied customers
—are the three reasons why.

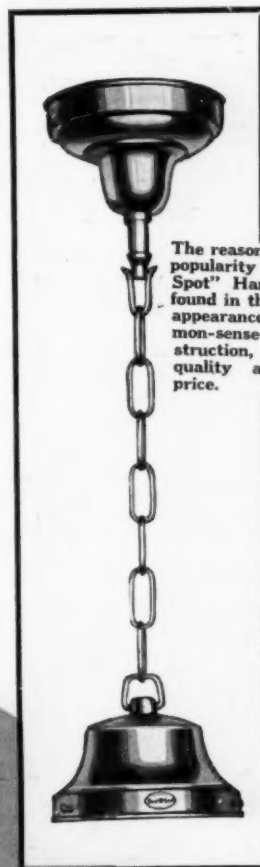
If you have any doubt, compare "Red
Spot" point by point with any commercial
hanger made. Below is the list of points
to consider:

The F. W. Wakefield Brass Co.

VERMILION, OHIO

RED SPOT

Pacific Coast Representative: Geo. A. Gray Company,
San Francisco and Los Angeles.



The reason for the popularity of "Red Spot" Hangers is found in their neat appearance, common-sense construction, high quality and low price.

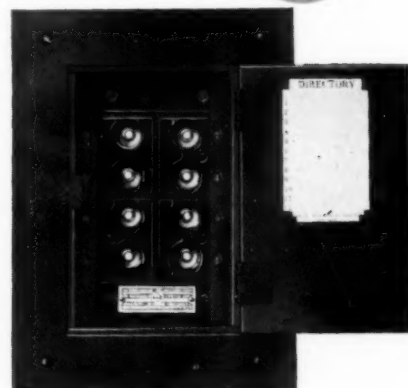
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**Points of
Superiority**

- 1—Twenty-two gauge metal inherent with fixture.
- 2—Deep flange insures neat covering of outlet box.
- 3—Individual switch may be mounted within canopy either by knock-out in flange or by special patented switch mounting which attaches firmly to main support of the fixture.
- 4—Neatly reamed oversize wireways.
- 5—"Absotite" brass chain having 120 pounds tensile strength.
- 6—Notched loop holds glassware in perfect balance.
- 7—Can be wired without removing socket.
- 8—Proper lamp position always obtainable.
- 9—Porcelain socket makes insulating joint unnecessary.
- 10—Bevel pointed screws in 5-thread bushing insures safe hold on glassware and prevents holder screws from loosening.
- 11—Upset threads prevent holder screws from being removed thus insuring three-point support on glassware.
- 12—"Red Spot" nameplate guarantees every unit to be in accordance with the Wakefield Specifications.
- 13—Snug fitting holder excludes dirt and insects.
- 14—Silk covered 14 gauge asbestos covered stranded cord supplied with each "Red Spot" Hanger.
- 15—Approved by the National Board of Fire Underwriters.
- 16—Carefully packed in individual cartons.
- 17—Heavy plated extra durable finish.

It's Ready

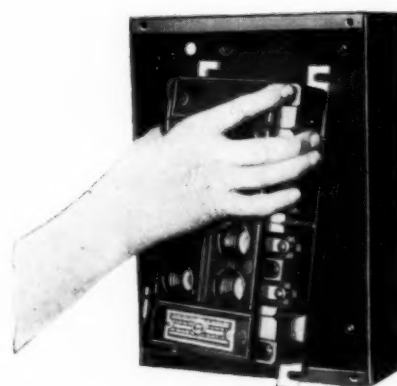
THE Westinghouse Type R & NR panelboard for residences, stores and apartments, is a new device with a sound profit-making idea back of it. The idea of cutting down installation costs for the contractor



Here's How It's Done—

Install only the steel box when the house is being roughed in. The panel is out and holes are provided to nail the box to the studding, if you wish. No time lost there. Then after the conduit is in, the wires pulled and the plastering finished, slip the panel into place, tighten four screws, and connect the circuits to the line. You've done a neat job and made money by saving time.

Use Westinghouse Type R or NR Panelboards on your next job—for residences, stores and apartment houses.



Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries



Westinghouse

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The Electragist

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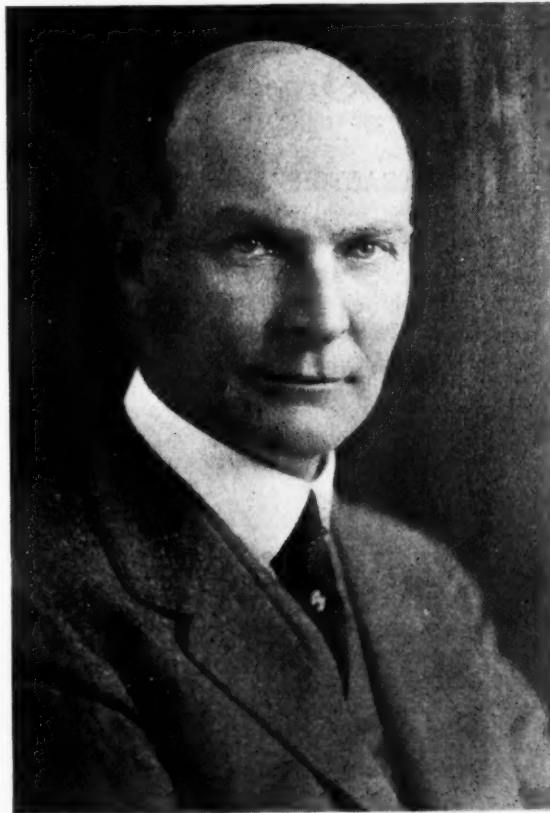
Gov. Trumbull to Address A. E. I. Convention

Tentative Program Discloses New Policy of Holding Executive Sessions on Subjects Where Free Expression of Opinion is of Utmost Importance

J. H. TRUMBULL, governor of Connecticut, president of The Trumbull Electric Manufacturing Company, and former electrical contractor will make the principal address at the Quarter-Centennial of the Association of Electragists, it was announced at Association headquarters last week when the tentative program for the convention to be held at West Baden, Indiana, September 23, 24 and 25 was drawn up.

The program this year marks a departure from the order of previous years in that the afternoon sessions are to be executive in character. For years all sessions, including the meetings of the Executive Committee, have been open to all. The executive committee decided in the Spring that it could accomplish more if the meetings were not open and now it is the opinion of the administration of the Association that on certain subjects the delegates to the convention will feel freer to express their opinions frankly if only Electragists are present.

Instead of taking four days as has been the custom the convention will be in session but three days this year, Wednesday, Thursday and Friday, September 23, 24 and 25. There will be open sessions each morning when the invited speakers representing other branches of



J. H. Trumbull
Electrical Contractor—Manufacturer—Governor

the electrical industry will address the convention. The afternoons of the first two days will be executive and devoted to business matters and committee reports. The afternoon of the third day is reserved for field sports.

Each evening is filled with entertain-

ment of a much more elaborate nature than ever before attempted at an A. E. I. convention. On Friday night the Electragists will act as hosts to the central station men attending the convention of the Great Lakes Division of the N. E. L. A., at French Lick Springs, a mile away.

In order that all might have an adequate opportunity to study the manufacturers' exhibits the convention will not open any morning until 10:30. There will also be time before and after the afternoon sessions.

The exhibits have been arranged differently this year in order to enable delegates to see all exhibits at once upon entering the rotunda and at the same time providing ample space in the center for dancing in the evening.

In announcing the appearance of Governor Trumbull on the program the officers of the Association of Electragists feel highly gratified. He is, so far as can be learned, the first governor to have started as an electrical contractor. Prior to starting The Trumbull Electrical Manufacturing Company in 1899 with his brother Henry Trumbull and Frank T. Wheeler, John Trumbull was an electrical contractor in Hartford.

The early training as an electrical contractor must have made an indelible impression because his policies as a

TENTATIVE PROGRAM 25TH ANNUAL A. E. I. CONVENTION

WEDNESDAY—SEPT. 23

MORNING

9:00 A. M. to 10:30 A. M.—
Exhibition period.
10:30 A. M.—Opening of Convention
Business.
10:45 A. M.—President's statement.
11:00 A. M.—Gov. J. H. Trumbull.
11:45 A. M.—O. Fred Rost, "The
Jobbers' View of Distribution."
12:30 P. M.—Recess.

AFTERNOON

Electragists' Sessions (executive)
2:00 P. M.—Trade Policy Report
Discussion.
3:00 P. M.—Business.
4:00 P. M.—Code Committee.
5:00 P. M.—Labor Section Meet-
ings.
EVENING—Costume Ball.

THURSDAY—SEPT. 24

MORNING

9:00 A. M. to 10:30 A. M.—
Exhibition period.
10:30 A. M.—Martin L. Pierce, Di-
rector of Research, The Hoover
Co.
11:00 A. M.—Wm. S. Boyd, Sec. and
Treas. Western Ass'n. of Elec-
trical Inspectors.
11:45 A. M.—S. L. Nicholson, "Uni-
form Electrical Ordinance."
12:15 P. M.—Presentation of Mc-
Graw Award.
12:30 P. M.—Recess.

AFTERNOON

Electragists' Sessions (executive)
2:00 P. M.—Technical sessions.
4:00 P. M.—Business.
5:00 P. M.—Association Secretaries.
EVENING—Play and Minstrel Show.

FRIDAY—SEPT. 25

MORNING

9:00 A. M. to 10:30 A. M.—
Exhibition period.
10:30 A. M.—W. J. Canada, Electri-
cal Field Secretary, N. F. P. A.
11:00 A. M.—Sherman L. Rogers,
Assoc. Editor "Success."
11:45 A. M.—Reports and Unfinish-
ed Business.
12:00 M.—New Business.
12:15 P. M.—Adjournment.

AFTERNOON

Field Day.

EVENING—Central Station Night.

manufacturer have been those that ap-
peal strongly to the best interests of
electrical contracting.

At the celebration of its twenty-fifth
anniversary last Fall the Trumbull com-
pany stated these policies from which
the following is quoted:

"This company desired association
with the best elements in the Trade. The
mandate had been 'create a demand.'
In creating such a demand the general
Trade must need be approached. But
the better Trade has its 'Character Class'
as surely as the better wholesalers. The
pathway to the better distributor was
through better Jobber, and better Con-
tractor. It was this pathway The Trum-
bull Company sought to travel in its
long march to the top.

"... Under the present method
of distribution (in which we firmly be-
lieve) each link in the chain—distribu-
tor, dealer and contractor—all who sell
—are entitled to their normal profits,
but above all, the ultimate consumer
must, at all times, be of first considera-
tion and given material that will satisfy
and a price that is reasonable."

Not only is this the policy on which
Governor Trumbull has built but it is
also the Trade Policy which the Asso-
ciation of Electragists has adopted and
discussion of which is expected to oc-
cupy the major part of one of the most
interesting sessions of the convention.

One Way to Exhibit Wiring
Cooperatively

CONTRACTORS' associations with
great regularity are asked to make
exhibits at electrical shows, or home
equipment shows and not infrequently
it is quite a problem to know what to
show. An excellent exhibit for the pur-
pose of showing the public the electri-

cal wiring necessities that make a home
comfortable was put on at the "Build
a Home" show in Pittsburgh recently
by the local Electrical Contractors As-
sociation.

Quality wiring can be shown in an
attractive manner as in the present case.



Estimating for Electrical Contractors

Lesson No. 8—House Wiring—Knob and Tube Work

By ARTHUR L. ABBOTT

Technical Director, Association of Electragists

FOUR tables are presented here showing the computation of outlet costs for knob and tube work in new and old houses. A summary of all costs is also shown. These tables, taken in connection with the table of service costs in the July issue, form a complete illustration of this method of estimating house wiring.

In order to make the use of these tables clear, the costs have been filled in in bold face type. In the practical application of the method, the sheets should be printed or type-written with the cost columns left blank. The contractor then fills in his own unit costs of material and labor and calculates the total cost of each class of outlet. Whenever there is a change of any importance in the market price of any item of material or in the wage scale, the figures must be corrected or the old sheets must be discarded and new ones made up.

In making up these tables it is a good plan to list quite a variety of special outlets, even those that are seldom used. The public is slowly but surely being brought to appreciate the convenience and economy of the completely wired house. By being able to

If more house wiring were really estimated instead of guessed at on the so-much-per-outlet basis the business would be much more profitable. Here is presented a simple way to collect data preliminary to estimating. The previous lesson covered services. Succeeding lessons will take up other methods of wiring houses.

—Editor.

convenience outlet for the flat-iron helps to take the drudgery out of ironing. The further combination of a bulls-eye pilot with this outlet gives considerable added safety from the most prolific cause of electric fires. A heater outlet in the bathroom will appeal to many people; if there are any special local requirements for such outlets a special price should be computed.

New House Work

In this table the average quantities of material and hours of labor are given for the ordinary, five to ten room house of frame interior construction. Outside walls of brick will not increase the labor cost if the walls are furred out enough so that boxes can be installed without cutting the brick, although some extra loom may be necessary for outlets on such walls. If houses are common in which outside brick walls require cutting or special construction, the additional cost of this work should be computed and included in the summary. The construction of the house will seldom affect the cost of this class of wiring in any other way.

In most cases the service conduit must enter the house at some fixed loca-

TABLE 1—KNOB AND TUBE WORK—NEW HOUSE

ITEM	Unit Cost	Lt. Outlet— Ceiling or Wall		Convenience Outlet		Conven. Outlet Full Circuit		Single—Pole Switch		3-Way Switch		4-Way Switch		Pilot Light and Switch	
		Quan- tity	Cost	Quan- tity	Cost	Quan- tity	Cost	Quan- tity	Cost	Quan- tity	Cost	Quan- tity	Cost	Quan- tity	Cost
No. 14 Wire ...	\$7.00	30'	\$0.21	30'	\$0.21	44'	\$0.31	30'	\$0.21	40'	\$0.28	40'	\$0.28	40'	\$0.28
Loom	18.00	4'	.07	4'	.07	4'	.07	4'	.07	5'	.09	5'	.09	4'	.07
Knobs	13.00	7	.09	7	.09	9	.12	7	.09	9	.12	9	.12	9	.12
Tubes	4.00	8	.03	8	.03	12	.05	8	.03	11	.04	11	.04	11	.04
Box—Lt. Outlet	.11	1	.11												
Box Support ...	.08	1	.08												
Box—Switch ...	.11			1	.11	1	.11	1	.11	1	.11	1	.11	1	.11
Sw. Box Suppor	.14			1	.14	1	.14	1	.14	1	.14	1	.14	1	.14
Conven. Outlet.	.30			1	.30	1	.30								
S. P. Switch ...	.30							1	.30						
3-Way Switch ...	.40									1	.40				
4-Way Switch ...	1.75											1	1.75		
Pilot & Switch.	2.00													1	2.00
Miscellaneous ...	.03		.03		.03		.03		.03		.03		.03		.03
Permit															
Labor—Hours ...	1.00	.75	.75	1	1.00	1.25	1.25	1	1.00	1.25	1.25	1.5	1.50	1.25	1.25
Total Cost...			\$1.37		\$1.98		\$2.38		\$1.98		\$2.46		\$4.06		\$4.04

TABLE 2—KNOB AND TUBE WORK—OLD HOUSE

Hard wood 2nd floor, single soft wood or no floor in attic

ITEM	Cost Unit	Lt. Outlet Ceiling or Wall		Convenience Outlet		Conven. Outlet Full Circuit		Single-Pole Switch		3-Way Switch		4-Way Switch		Pilot Light and Switch	
		Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
No. 14 Wire ...	\$7.00	44'	\$0.31	40'	\$0.28	45'	\$0.32	40'	\$0.28	45'	\$0.32	45'	\$0.32	40'	\$0.28
Loom	18.00	20'	.36	15'	.27	15'	.27	15'	.27	25'	.45	25'	.45	12'	.22
Knobs	13.00	6	.08	6	.08	6	.08	6	.08	5	.07	5	.07	6	.08
Tubes	4.00	6	.02	6	.02	6	.02	6	.02	5	.02	5	.02	6	.02
Box—Lt. Outlet	.11	1	.11												
Box Support ...	.08	1	.08												
Box—Switch ...	.11			1	.11	1	.11	1	.11	1	.11	1	.11	1	.11
Conven. Outlet	.30			1	.30	1	.30		.30						
S. P. Switch ...	.30							1	.30						
3-Way Switch ...	.40									1	.40				
4-Way Switch ...	1.75											1	1.75		
Pilot & Switch	2.00													1	2.00
Miscellaneous	.03		.03		.03		.03		.03		.03		.03		.03
Permit															
Labor—Hours	1.00	2	2.00	2.25	2.25	2.3	2.30	1.8	1.80	2.2	2.20	2.4	2.40	2	2.00
Total Cost ...			\$2.99		\$3.34		\$3.43		\$2.89		\$3.60		\$5.15		\$4.74

tion, and this in turn determines the location of the service switch. As a result, in some houses the main direction of most of the runs will be across the joists, while in others more wire will be run parallel to the joists. Some variation will therefore be found in the number of knobs and tubes required. This will only slightly affect the material cost, but when the number of tubes is above the average quantity and the number of knobs is less than the average, the labor cost will be increased a little, and vice versa. Quantities of wire and loom per outlet should not vary a great deal in jobs of the same class.

The unit times given in the table should not be exceeded as an average. Some contractors are able to reduce these items about one-third. This is

accomplished by keeping records so that you know positively what is accomplished on each job, and then by always having a full supply of material on the job, teaching the men to systematize their work, making sure that the men are always provided with the proper tools, and in some way providing an incentive for the men to produce. The contractor must also have a considerable volume of work so that the men are sure of steady employment.

Some jobs will show a much greater labor cost than the average. There is always a reason for this when it occurs, and it is well worth while for the contractor to investigate such cases. Some possible causes of excessive labor costs are errors in filling out time cards, delays and return trips to the job caused by the building contractor's methods,

inherent features of the house which cause extra labor. Houses of the latter class should be spotted by the estimator and the price made to fit the job.

Old House Wiring

The material quantities and times given in Table 2 apply to knob and tube wiring in a type of house which is very common in many parts of the country, a two-story frame building with basement having hard wood floors laid over a soft wood underfloor on the first and second floors, and with a single soft wood floor, or no floor, in the attic.

There are an infinite number of structural variations in old houses. The careful estimator on old house work will acquire a general knowledge of construction types and "periods" in

TABLE 3—KNOB AND TUBE WORK—OLD HOUSE WITH NO CEILING IN BASEMENT

Outlets installed under single soft wood floor

ITEM	Unit Cost	Ceiling Outlet in Basement		Lt. Outlet—Ceil'g or Wall		Convenience Outlet		Conven. Out. Full Circuit		Single-Pole Switch		3-Way Switch		4-Way Switch		Pilot Light and Switch	
		Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
No. 14 Wire	\$ 7.00	30'	\$0.21	40'	\$0.28	40'	\$0.28	45'	\$0.32	35'	\$0.25	40'	\$0.28	40'	\$0.28	40'	\$0.28
Loom	18.00	4'	.07	15'	.27	15'	.27	15'	.27	15'	.27	20'	.36	20'	.36	12'	.22
Knobs	13.00	7	.09	6	.08	6	.08	6	.08	5	.07	5	.07	5	.07	6	.08
Tubes	4.00	8	.03	6	.02	6	.02	6	.02	5	.02	5	.02	5	.02	6	.02
Box—Lt. Outlet	.11	1	.11	1	.11												
Box Support .	.08	1	.08	1	.08												
Box—Switch .	.11					1	.11	1	.11	1	.11	1	.11	1	.11	1	.11
Conven. Outlet	.30					1	.30	1	.30								
S. P. Switch .	.30									1	.30						
3-Way Switch	.40											1	.40				
4-Way Switch	1.75													1	1.75		
Pilot & Switch	2.00															1	2.00
Miscellaneous	.03		.03		.03		.03		.03		.03		.03		.03		.03
Permit																	
Labor—Hours	1.00	.75	.75	1.5	1.50	2	2.00	2.25	2.25	1.6	1.60	2	2.00	2.2	2.20	2	2.00
Total Cost .			\$1.37		\$2.37		\$3.09		\$3.38		\$2.65		\$3.27		\$4.82		\$4.74

TABLE 4—KNOB AND TUBE WORK—OLD HOUSE WITH NO CEILING IN BASEMENT

ITEM	Unit Cost	Outlets installed under hard wood floor															
		Ceiling Outlet in Basement		Lt. Outlet—Ceil'g or Wall		Convenience Outlet		Conven. Out. Full Circuit		Single-Pole Switch		3-Way Switch		4-Way Switch		Pilot Light and Switch	
		Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
No. 14 Wire ...	\$ 7.00	30'	\$0.21	50'	\$0.35	40'	\$0.28	45'	\$0.32	45'	\$0.32	55'	\$0.39	55'	\$0.39	40'	\$0.28
Loom	18.00	4'	.07	20'	.36	15'	.27	15'	.27	20'	.36	30'	.54	30'	.54	12'	.22
Knobs	13.00	7	.09	7	.09	6	.08	6	.08	6	.08	6	.08	6	.08	6	.08
Tubes	4.00	8	.03	8	.03	6	.02	6	.02	6	.02	6	.02	6	.02	6	.02
Box—Lt. Outlet	.11	1	.11	1	.11												
Box Support ...	.08	1	.08	1	.08												
Box—Switch ...	.11					1	.11	1	.11	1	.11	1	.11	1	.11	1	.11
Conven. Outlet .	.30					1	.30	1	.30								
S. P. Switch ...	.30									1	.30						
3-Way Switch .	.40											1	.40				
4-Way Switch .	1.75													1	1.75		
Pilot & Switch.	2.00															1	2.00
Miscellaneous .	.03		.03		.03		.03		.03		.03		.03		.03		.03
Permit																	
Labor—Hours .	1.00	.75	.75	2.7	2.70	2.9	2.90	3	3.00	2.9	2.90	3.2	3.20	3.3	3.30	2	2.00
Total Cost ...			\$1.37		\$3.75		\$3.99		\$4.13		\$4.12		\$4.77		\$6.22		\$4.74

house building, and will in most cases be able to predict quite closely what will be found under the surface. If many of the houses in a certain locality fall under two or more distinct classes, outlet costs should be made up for each class.

Outlet Prices for Salesmen

When house-wiring jobs are sold by solicitors in the employ of the contractor on a commission basis, or by solicitors employed by the central station company the conditions are quite different from those when the contractor does his own sales work. The contractor has a practical knowledge of the work, and his compensation is the profit in the jobs. The paid solicitor on the other hand is usually not a house-wiring expert and is not directly interested in profits. It is therefore desirable to furnish him with a scale of prices which will cover all conditions as nearly as possible. This can be done by working up two sets of prices, one for first or second floor outlets installed under single soft-wood floors, and another for first or second floor outlets installed under hard-wood floors. Hard-wood floors are of course almost universally laid over a soft-wood under floor.

Tables 3 and 4 are made up on this basis. This is a somewhat more accurate method than using Table 2. Table 2 will fit one class of house only, and the prices arrived at are averages for outlets located in the various stories. Table 3 and 4 will fit a much larger range of cases met with, and each price is for an outlet in a definite location instead of being an average for all locations.

It is really preferable to make use of Tables 3 and 4, though both in estimating jobs and in compiling and checking the units it is much simpler to use Table 2.

It is much more difficult to secure a high rate of production on old house work than on new work. The work cannot be so nearly standardized, and the quality of the work will suffer if the work is hurried. Wiremen who are neat about their work and cause little disturbance will bring the contractor much business, but to do the work in

this way requires some extra time.

Summary

Table 5 is a summary of all costs, both for services and outlets. This is the form in which all costs and prices are finally assembled for use in estimating jobs. The selling price column is filled in by adding a mark-up which will cover the contractor's overhead and the profit desired. There are few contractors who can handle house-wiring on an overhead of much less than 35 percent on the cost of labor and material. This means that if \$15 net profit

KNOB AND TUBE WORK—SUMMARY SERVICES

	Cost		Selling Price	
1 or 2 Circuits, 2-Wire	\$17.08		.....
3 or 4 Circuits, 2-Wire	18.64		.....
5 to 8 Circuits inclusive, 3-Wire	23.15		.....
	New House		Old House—Table 2	
	Cost	Selling Price	Cost	Selling Price
Light Outlet, Ceiling or Wall ..	\$1.37	.....	\$2.99	.....
Convenience Outlet	1.98	.....	3.34	.....
Convenience Outlet, full circuit.	2.38	.....	3.43	.....
Single-Pole Switch	1.98	.....	2.89	.....
3-Way Switch	2.46	.....	3.60	.....
4-Way Switch	4.06	.....	5.15	.....
Pilot Light and Switch	4.04	.....	4.74	.....
	Old House			
	Table 3—Under Single Floor		Table 4—Under Hard Wood Floor	
	Cost	Selling Price	Cost	Selling Price
Light Outlet, Ceiling or Wall...	\$2.37	.....	\$3.75	.....
Convenience Outlet	3.09	.....	3.99	.....
Convenience Outlet, full circuit.	3.38	.....	4.13	.....
Single-Pole Switch	2.65	.....	4.12	.....
3-Way Switch	3.27	.....	4.77	.....
4-Way Switch	4.82	.....	6.22	.....
Pilot Light and Switch	4.74	.....	4.74	.....
Ceiling Outlet in Basement.....	1.37	.....	1.37	.....

NEW HOUSE JOBS

Job No.	Name	WIRE			LOOM			KNOBS			TUBES			LABOR		
		Com- puted	Actual	%	Com- puted	Actual	%	Com- puted	Actual	%	Com- puted	Actual	%	Com- puted	Actual	%
121	Smith	790'	870'	110	102'	92'	90	181	208	115	210	235	112	22.5	25.5	113
130	Brown	1310'	1140'	87	164'	153'	93	292	263	90	336	306	91	35	34	97
132	Jones	975'	916'	94	130'	139'	107	230	223	97	268	252	94	29.5	26	88

(10%) is wanted on a job selling for \$150, or \$10 profit on a \$100 job, 50 percent mark-up must be added to all costs.

Compiling and Checking the Cost Figures

In order to check the figures given in the tables, at least a dozen completed jobs should be selected which are believed to be fairly representative of the class of houses most commonly built in the given locality. Taking the cost records of these jobs, the service material should be first checked off. Then, assuming that new house jobs have been selected, compute the wire required for each job, using the quantities per outlet given in Table 1. Compare the feet of wire so computed for each job with the actual number of feet used. If on most of the jobs the actual quantity used is reasonably close to the computed quantity, but on two or three there is a large difference, throw out these jobs, and total the quantities used on the rest. For example, if on twelve jobs the wire is within 15 percent of the computed quantity, but on the other two the actual feet runs 50 percent over the computed feet; these two jobs should be thrown out, because they either belong in a different class or the records are at fault.

Suppose that on the remaining ten jobs the computed quantity of wire is 8240 ft. and the actual amount used was 7410 ft., this is approximately 10 percent less, you will then be justified in assuming that for this class of jobs the quantities of wire per outlet given in Table 1 should be reduced 10 percent.

The same procedure should be followed with the loom, knobs, tubes, and labor. Then spend a little time on several jobs with a tape measure, and satisfy yourself as to the correct quantities of material used for 3-way switches and other special outlets requiring more material than the average for other outlets.

Material and labor on old houses should be checked in the same manner.

It is also a very good plan to check all jobs against the figures in the tables as soon as the work is completed, or if this seems to take too much time, apply the check to eight or ten jobs per month, computing for the wire, loom, knobs, tubes and labor hours, the percentage which the actual quantity is of the computed quantity. Such a record may be kept in the form shown at the top of this page.

A complete record should also have several additional columns for estimated and actual costs of material and labor for the service, and total estimated and total actual costs of material and labor for the circuit work.

Records of this kind will be found very valuable. They will result in closer estimating, better supervision and decreased labor costs. Of course, new jobs must be secured, the work must be done, and the money must be collected, or the business will come to a standstill. The keeping of special records cannot be allowed to interfere with the activities on which the business depends for its existence. However, it is quite possible that if the contractor can arrange to keep the record described above by adding a small amount to his overhead, this expenditure will be much more than made up by the increased profits.

Letter to the Editor FEEDER SIZES

Editor of the Electragist:

In the editorial section of the June issue, I notice your comments on feeder sizes—"How Large Should a Feeder Be."

I certainly feel that a little discussion on this proposition would be of advantage to the entire industry. I have carefully checked under the new National Code in connection with power work, and I find a peculiar situation, in that under certain conditions, if a fuse is used, the wire between the main and the motor starting device has got to be larger than if a fuse is eliminated

under the 15 ft. rule. I think that, certainly, some agreement could be worked out. The matter would certainly be a good one for discussion among our fraternity.

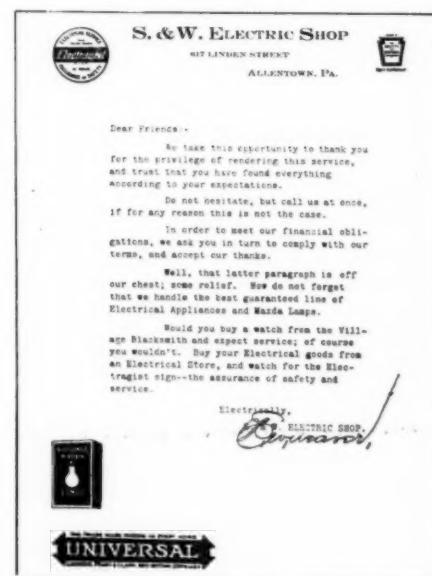
Trusting that you will see fit to bring this to the attention of the electrical industry,

M. L. POMARES, Vice-Pres.,
Austin & Moore, Inc.

Long Island City, N. Y.

This Letter Helps Build Good Will

One way of creating good will and at the same time laying a foundation for future business, has been found by W. M. Solliday and E. W. Weaver of the S & W Electric Shop of Allentown, Pa., who drew up the following letter and make a practice of enclosing it with each bill sent out:



It will be noticed that they prominently feature the ELECTRAGIST trade mark at the head of the letter, and also in the text, calling attention to it by advising the customer to "watch for the ELECTRAGIST sign—the assurance of safety and service."

This idea cements the contact with the customer.

Recent Developments in Electric Motor Control

A Discussion of the Use of Temperature Relays and Magnetic Switches or Contactors for Building Equipment Overload, Underload, Start and Stop Control

By C. F. SCOTT,

Industrial Department, General Electric Company, Schenectady, N. Y.

READERS of THE ELECTRAGIST, in the course of their business, have many occasions to select and install control devices for electric motors in heating and ventilating systems, pumping equipments and the variety of motor applications which form a part of the electric system of a modern building.

Progress has been made in the development of electric motor control in recent years and it is the purpose of this article to review some of this advancement, and to describe some of the devices. Three lines of development have particularly characterized improvements in electric control for fans and pumps.

One has been the development of safety devices. Safety type enclosures have been standardized for all types of starters and speed controllers and there is no longer any occasion for the installation of the open type devices, except when located in rooms to which no one except a few authorized and skilled individuals have access.

Another important development has been in protective devices. While the principal form of protection required for electric motors and control is overload protection, undervoltage protection is needed for those installations which should not be allowed to start automatically upon resumption of voltage if they have shut down upon failure of voltage. This problem, however, is so simple that it may be passed over.

In the early days fuses were relied upon almost exclusively for overload protection. While fuses have a slight time lag, they are not ideal for motor protection. They are especially undesirable for motors that have a high starting current, such as squirrel cage induction motors. This characteristic is illustrated by the number of devices for starting a motor with the fuses out of

circuit, and by the practice of putting the fuses into circuit in the running position of the starting switch.

The ideal overload protective device is one which permits short time overloads, such as might be required in starting the motor or in overcoming some peak in the duty cycle, but causes the motor to stop if the overload continues long enough to bring about excessive heating, or is of such excessive value as to cause damage by heating or sparking in a short time.

The circuit breaker does not make an

as to heat up at about the same rate as the motor would heat up under excess current. The heating of these elements causes a thermostatic strip of metal to trip a relay contact and open the control circuit of the motor.

It will be noted at once that such a device functions only when employed in conjunction with a magnetic switch or contactor for making and breaking the motor circuit. With the increasing use of remote control, which is the third general line of improvement in electric motor controls, the use of the temperature relay fits in admirably.

In conjunction with manually operated starters and speed regulators, the magnetic main line contactor, or any equivalent device closed by hand and held closed by a magnetic coil, will, in conjunction with the temperature relay, form a combined overload protective and circuit opening means, replacing the conventional fuses and switch. Such a device may be a standard unit, stocked by the electragist in the same way that he would carry switches and fuses, and applied to a variety of starters and speed regulators, or the two devices may be incorporated into the control itself.

As mentioned, a third characteristic of improvements in control lies along the line of remote start and remote speed control. For many years certain forms of pump starters have been of the remote or automatic type in order that the pump might start and stop automatically in accordance with the demands made on the water system to which it was related. This will apply to sump pumps, pumps supplying water to open tanks or pressure systems, and many other applications. It is only recently, however, that widespread use has been made of remote control for fans and blowers.

There are three distinct reasons for

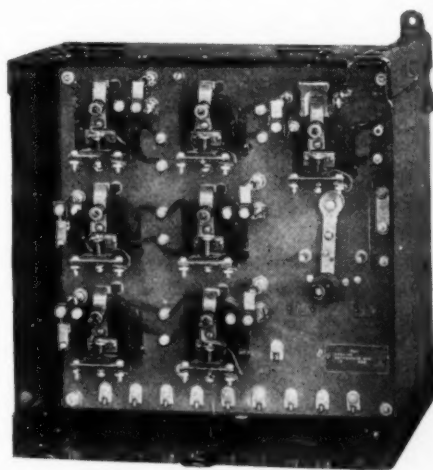


Fig. 1—Remote start, preset, speed control for d. c. adjustable speed, fan motor, with magnetic main line switch and temperature relay (cover removed)

ideal overload protective device for motors because, while it is possible to incorporate an inverse time element, such an element is, as its name implies, responsive to a definite time lag but is not responsive to the heating of the motor.

These considerations have led to the development of the temperature relay, a device in which are incorporated coils of wire or other suitable elements carrying the motor current and so adapted

the use of this type of control. The first is where the service demands automatic response, as noted above in the case of certain classes of pumps, and as may be needed for forced or induced draft fans. The second is where it is desired for convenience to start and stop the motor at some point remote from the motor. A condition illustrating this class of requirements would be that of

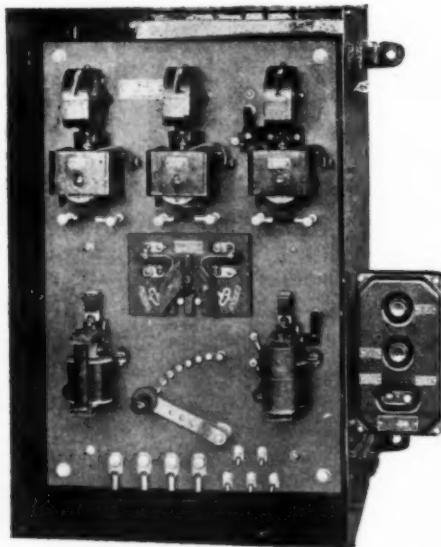


Fig. 2—Three speed, remote indicating, speed control for d. c., adjustable speed, fan motor. (Cover removed)

a fan motor located in a rather inaccessible monitor over the auditorium. A third reason for the automatic control lies in the greater reliability of the magnetic, as against the manual, starter for uniform acceleration and the general elimination of the human element.

These considerations have led to widespread adoption of the magnetic control even where the push button stations for its operation are located adjacent to the device and close at hand to the motor itself—conditions, in fact, where manual start or control could actually be employed but where it has come to be regarded as less desirable.

Magnetic starters and speed controls have been standardized to an extent where they may be obtained quickly, installed at comparatively little expense and are actually subject to less maintenance expense and upkeep than many types of manual controller.

The moving of a speed controlling handle back and forth over a number of flat segments frequently brings about burning of the segments and a loosening of the handle and switch parts, which results in rapid deterioration. In the

case of magnetic starters and controllers the circuits are made and broken on magnetic switches furnished with blow-out magnets and arc-chutes designed to suppress the arc without damage to the contact parts. Such devices last almost indefinitely when properly selected, with at best no upkeep expense beyond the occasional renewal of contact tips.

The success or failure of magnetic control usually depends principally upon the design and construction of the magnetic contactors and relays themselves. Where these are of a high quality and where the accelerating principles are along the right lines, the controls will be found to be reliable.

The control illustrated in Fig. 1, is of the remote start, pre-set speed type. The switch handle may be set at a point corresponding to any desired operating speed and, when the control is started by means of a push button, the starter automatically accelerates the motor to the speed for which the switch handle had previously been set. This control provides for a speed range on direct current motors by shunt field control of from 50 percent to 100 percent increase above normal speed or, put it another way, a decrease of from $33\frac{1}{3}$ to 50 percent of the maximum speed of the motor. Incorporated in this control are a double pole magnetic main line switch and a temperature relay. Thus the entire device is self-contained and requires no separate switch and fuses. A push button station is located immediately adjacent to the device and another one may be located at a remote point.

A still further development of the remote control principle is incorporated in the remote indicating control. In this type of control the motor is not only started and stopped from a remote point but the speed can be changed from a remote point.

Two types of the remote indicating control will be here described. In the type illustrated in Fig. 2, provision is made for three or four different speeds. A remote indicating control station is fitted with a push button corresponding to any desired speed and another for stopping the motor. The button corresponding to any desired speed may be pressed and the motor will then start and automatically accelerate to that speed, and when that speed has been reached, a pilot lamp will be lighted showing that the motor has reached the speed selected. While the motor is run-

ning at any given speed, the speed may be changed to any other value by simply pushing the button corresponding to the speed selected. When the motor has reached the new speed, its corresponding pilot lamp will be lighted and the previous one extinguished. The buttons may be manipulated in any succession. Pressure on a single button only is required to bring the motor up to the selected speed.

In another form of the remote indicating control a master switch instead of a push button station is employed. Here the speed is indicated by the position of the switch handle. It is usually desirable to have a push-button station mounted beside the master switch, combining a stop button and a lamp which indicate that the motor is running, this lamp being extinguished when the stop button is pushed. With this form of control the motor may be started either at a point adjacent to it or at a remote point and, when started, it will accelerate automatically to the speed corresponding to the master switch setting.

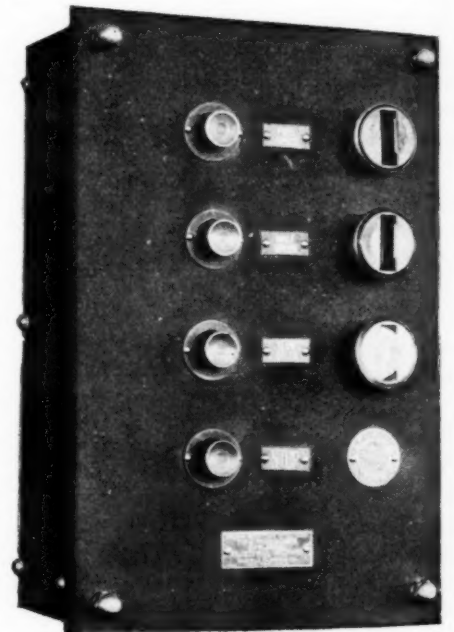


Fig. 3—Speed indicating push button station with pilot lamps for use with the controller illustrated in Fig. 2

In some cases it is considered important that the motor be started only by a man who goes to the motor room and observes that the equipment is as it should be before starting. With such an arrangement the man who starts the motor can exercise no control over the speed at which it is to run, which is to be determined by the setting of the switch in the engineer's room. It is not,

however, possible to start the motor from an engineer's room but it can be stopped at that point, or the speed changed from one value to any other value.

Of course this control can be arranged for remote start also, and in such cases it has been a comparatively simple matter to have indicating lamps or other indicating devices installed to make certain that the motor is running properly when the remote starting switch is energized by the push-button station. Controls of this kind are coming into extensive use for various types

of blowers and exhausters used in ventilating systems. They are, of course, applicable to a wide variety of other uses.

These remote indicating controls require a very simple wiring, a control cable, with eight or nine conductors at the most, running between the motor and the remote located control station being sufficient.

Further progress in electric motor control may be expected in the way of greater simplicity of details of design of the control elements and the increasing adoption of magnetic control.

While there is an increased tendency toward the use of automatic devices; that is, devices in which starting, stopping, and speed regulation, if any, are responsive to elements which are independent of human selection, it is generally recognized that the elimination of the human element to too great an extent may not be desirable if the adoption of such elimination results in carelessness or if the devices intended to establish the elimination are so elaborate and complicated as to cause in the end more trouble than if the human element were retained.

Better Wiring Urged in Denver League Advertising

THE adjacent advertisements were used this year by the Denver Co-operative League in its annual campaign during the spring building season, to bring the subject of better wiring to the minds of prospective home builders and buyers.

They were run on the real estate pages of Denver's three newspapers and were financed directly out of league funds. While they have no official connection with the third electrical home exhibition, league officials believe they were in a large measure one of the principal contributing factors to the success of that movement.

S. W. Bishop, executive manager of the league states that a number of replies were received, especially in relation to the literature offered gratis. These were turned over to a staff organized for the purpose and placed on a list to receive further printed matter.

The advertisements show a breaking away from the more or less fixed type of electrical contractors style of advertising and in each case produce an unconscious suggestion to read on and learn more about the subject.

Appearing as they do on the real estate pages they not only appeal to the individual home builder but make a suggestion to the speculative builder and developer of groups of homes to check up on wiring and "play safe."

At the same time they suggest to him that as his prospective clients are also reading the pages and noting these advertisements, the quality of wiring he has had installed will get a closer inspection than heretofore.

A Home Where There Is No Work

At least, electrical labor-saving appliances reduce it to a minimum. Washing machines, vacuum cleaners, percolators, fans and a host of other electrical necessities, for complete and satisfactory operation, require adequate electric wiring, including plenty of convenience outlets.

Be sure that new home is wired properly. Consult the League in advance. It's a service rendered by the electrical industry. Play safe!

And Visit Denver's "Labor Less" Electrical Home—Open Soon

Electrical Co-operative League

Phone Champa 7273 403 Gas & Electric Bldg.

House Wiring Plans Free

Explaining and illustrating proper home electrification. Our experts will gladly advise you on any electrical problem. No charge or obligation.

Watch for Denver's Third Electrical Home

ELECTRICAL CO-OPERATIVE LEAGUE

Phone Champa 7273 403 G. & E. Bldg.

Your Wife Knows

that you have to live with the lighting fixtures in your home.

Be sure that the new home has proper lighting—not faddish ornamentation.

Figure 3% of construction costs for lightning fixtures. Play safe!

—and visit Denver's third electrical home when it is opened late in May.

Electrical Co-operative League

403 Gas & Electric Bldg.

"EQUIPPING YOUR HOME ELECTRICALLY"

An attractive 48-page book of suggestions covering the most economical methods of making electricity do your work.

Copies are available for prospective home builders or buyers in Denver—without charge or obligation.

Electrical Co-operative League

403 Gas & Electric Bldg.

This kind of cooperative advertising in Denver produced a number of inquiries for more information about better wiring.

6% for Electric Service

In planning a home 6 per cent of the total construction cost should be estimated for adequate electric service; 3 per cent for wiring—3 per cent for lighting fixtures. This is an average minimum figure for safety. Be sure the electrical features are not sacrificed to superficial "fol-de-rols." Play safe!

Denver's third electrical home will be exhibited next month.

Electrical Co-operative League

Phone Champa 7273 403 Gas & Electric Bldg.

A Word of Warning

Be sure the house you build or buy is adequately wired for electric service. It's better and cheaper to anticipate rather than to regret.

To aid you, a consulting service for residents of Denver and suburban towns is provided by the electrical industry—without charge or obligation.

Bring your building plans in or ask for interesting descriptive literature. Play safe!

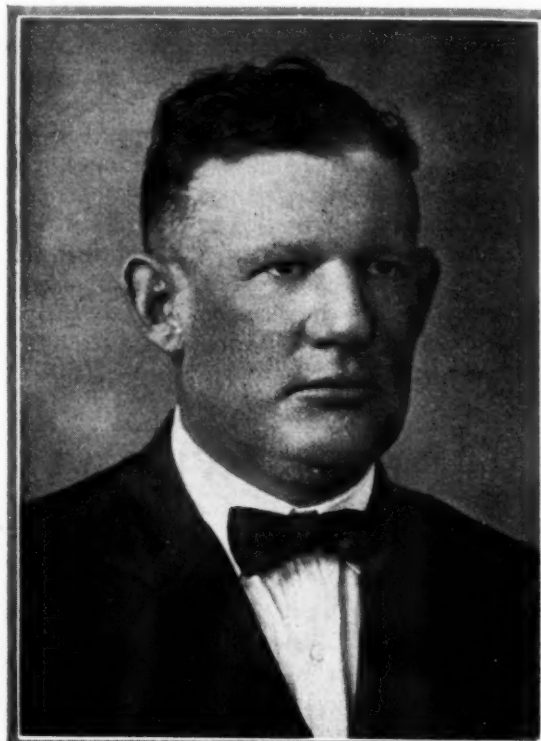
Watch for Denver's Third Electrical Home Near Washington Park

Electrical Co-Operative League

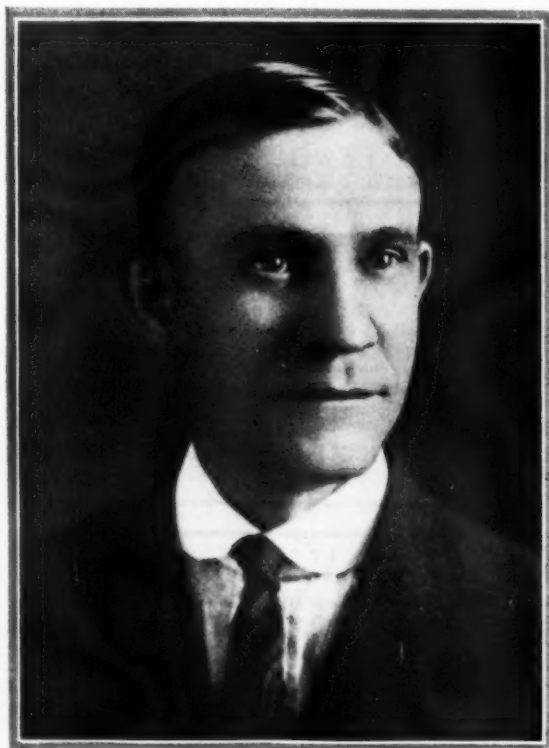
Phone Champa 7273 403 Gas & Electric Bldg.

Charles W. Graham, Dallas

When the Texas state organization of electrical contractors and dealers was formed about a year ago, Charles W. Graham of Dallas was one of the men who performed some of the most important work in bringing it into existence and has acted as its secretary since then. Mr. Graham was born in Kentucky in 1881 and entered the electrical field there as a helper, building a small town lighting plant when he was eighteen years old. Upon the completion of this job he went to work as lineman for the Bell Telephone Company, afterward becoming installer of switchboards and interior equipment. He came to Dallas in 1902 and obtained work there as helper and stock keeper for W. M. Clower. He burned a great deal of midnight oil, mastering the technical side of the business and inside of a year was made journeyman electrician. In this capacity he continued for two years and then made application for the post of City Electrician. Though he was only twenty-five years old he was appointed and held the office for two years, when he resigned to become the general superintendent for a string of ice and light plants owned by a Texas syndicate, with whom he remained until the plants were disposed of to another company. He then returned to Dallas as superintendent of a contracting business, in which he owned stock. Afterward he sold his interest in this firm and opened business under his own name in 1923. The company confines its business strictly to construction work and now does an annual business of about \$100,000. In addition to holding office in the state association, Mr. Graham is secretary of the Dallas organization of contractors and dealers and is also chairman of the board of examiners for the city of Dallas and city supervisor.



Electragists You Should Know



E. A. Drury, Toronto

Kimberley, South Africa, is more generally associated in the public mind with diamond mines than with the electrical profession, yet there is where E. A. Drury elected to begin his wiring career. Mr. Drury was born in London, England, in 1884, and by 1898 was learning the how and why of electrical wiring in South Africa. When the Boer War broke, he turned from screwdriver and pliers and shouldered a gun, serving with the British through the campaign there. Afterward he returned to the electrical game. In 1904 he migrated to Canada, where he worked as a wireman for various contractors until 1909. In that year he started a housewiring business, sticking mainly to new houses, and nine years later decided it was time to take advantage of the demand for appliances. Accordingly he opened a small store in the Oakwood-St. Clair district. Business was good from the start and two years later he moved to larger quarters in the Danforth district of the city. At the present time the selling of appliances and lamps forms the larger part of his business, though he still continues to do considerable wiring. Mr. Drury is a thorough believer in and practitioner of electragist principles and has been a member of the international association for many years. He has also been prominent in local organization work and is one of the charter members of the Ontario Association of Electrical Contractors and Dealers, which was formed in 1914. He also holds membership in the Electric Service League, the Society for Electrical Development, the Danforth Business Men's Association and various fraternal organizations.

Square Conduit for Underfloor Circuiting

Details of Construction, Installation and Costs of New Duct System for Increasing the Accessibility of Electric Service in Large Office Buildings

EVER since office buildings of fire-proof construction began to be common, engineers and contractors have been confronted with a difficult problem in the distribution of electrical energy. The conduit system of wiring makes it a simple matter to supply all requirements for light (since desk lamps became obsolete) and for power in the larger units, but the wiring system in an office building must go much further. The modern office must have available at every desk connections for three kinds of electrical service: 110 volt power for small motors, telephone service, and miscellaneous low tension signaling systems. Every possible location of the desks must be provided for. Twenty years ago it was a serious problem to provide for telephone and signal wires, and the few appliances then in use. Now the number of motor-driven office appliances has increased until the mod-

ern office has been compared to a factory, and the problem is correspondingly more complex.

There are different ways in which this problem has been worked out satisfactory, the most recent of which has been given the trade name of the All-Steel Under-Floor Duct System. If the layout is made with due care, the system will provide outlets wherever needed. The component parts have been well thought out and are very substantial and the assembly makes a workmanlike job.

The materials for the installation of this system include ducts of square drawn steel tubing, cast iron junction boxes, inserts for tapping the ducts wherever an outlet is desired, and suitable "standpipes" for attachment to the inserts.

The ducts are of square section, $1\frac{1}{2}$ in. by $1\frac{1}{2}$ in. outside measurements, No. 14 U. S. gage in thickness, and are fur-

nished in 10 ft. lengths. Slip couplings of the same material are furnished. These are $4\frac{1}{2}$ in. long and fit tightly over the end of the duct, and are provided with pointed set screws which make a positive grounding connection between the couplings and the duct besides serving to secure the couplings in position.

The body of the junction box is either 5 in. or 7 in. square and has either two or three openings on each side, to accommodate either a two-duct or a three-duct system. The box shown in the illustration of the work as installed (Fig. 1) was designed to receive the square ducts on two opposite sides and pipe on the other two sides. A more recent type (Fig. 4-B) has openings for ducts on all four sides, though by using special tapped washers (Fig. 4-D) 1 in. or any smaller size of pipe can be run to any opening.

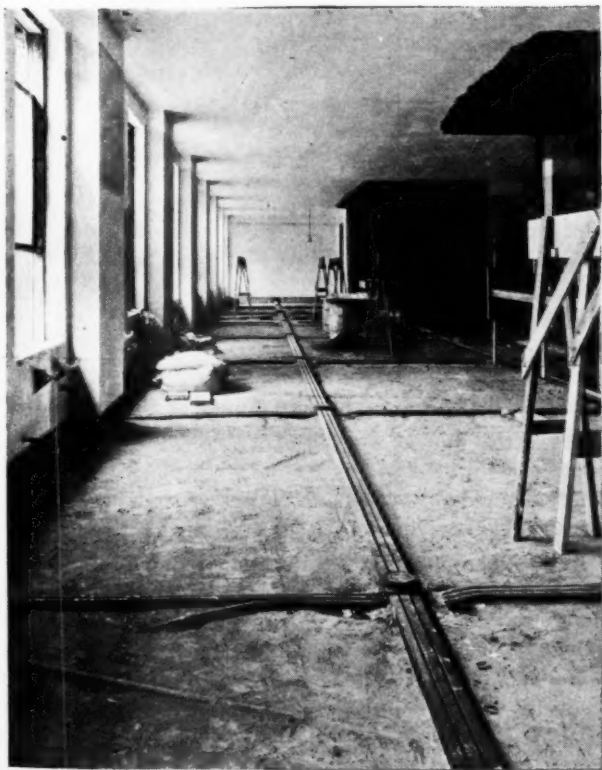
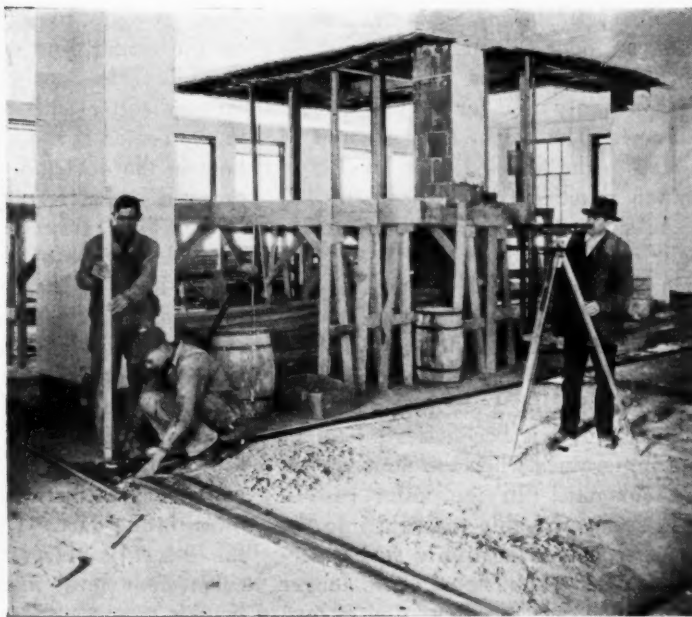


Fig. 1 (left)—Square Duct Installation with Conduit Laterals Prior to Pouring Concrete Fill

Fig. 2 (below)—Setting Box in Hole Channelled in Concrete Slab for that Purpose



The ducts are slipped into the box openings up to a shoulder, and cemented in place with "smooth-on" cement. A positive metallic bond between the box and the duct is secured by means of a pointed setscrew in the box which engages with the end of the duct.

A permanent cast iron cover having a circular opening is bolted to the box

above the bottom of the box. The ducts will therefore always be well above the top of the slab (in the slab-and-fill type of floor). An adjustable steel support (Fig. 3-D) is furnished to support the duct runs at couplings. These supports are notched to receive the ducts and so serve to keep the ducts uniformly spaced.

The manufacturers furnish ducts of

"preset" at any desired spacing (Fig. 3-A, B and D) the spacing being commonly 30 in. The inserts in this case are made of steel tubing 1 3/16 in. in diameter and are exactly the right height to come flush with the floor. Each insert is die-formed into a hole punched in the duct, in such a manner as to make a rigid water-tight joint with a smooth rounded bead which facilitates wire pulling. The upper end of the tube is closed with a cup-shaped steel cap which is filled with cement when the floor finish is laid. When the insert is to be used, the cap is pried out and a brass nipple, threaded internally and provided with a small flange, is inserted in the opening. This fitting is expanded and securely held in place by screwing in the standpipe.

The first cost of the system will be increased by using ducts with preset inserts, but by the time the system has been fully utilized such an installation will show a net saving over the use of the plain ducts.

A stand-pipe about 3 1/2 in. high (Fig. 6) is attached to either form of insert to carry the wires up away from the floor. Three types are employed. A plain brass cap with a rounded open-

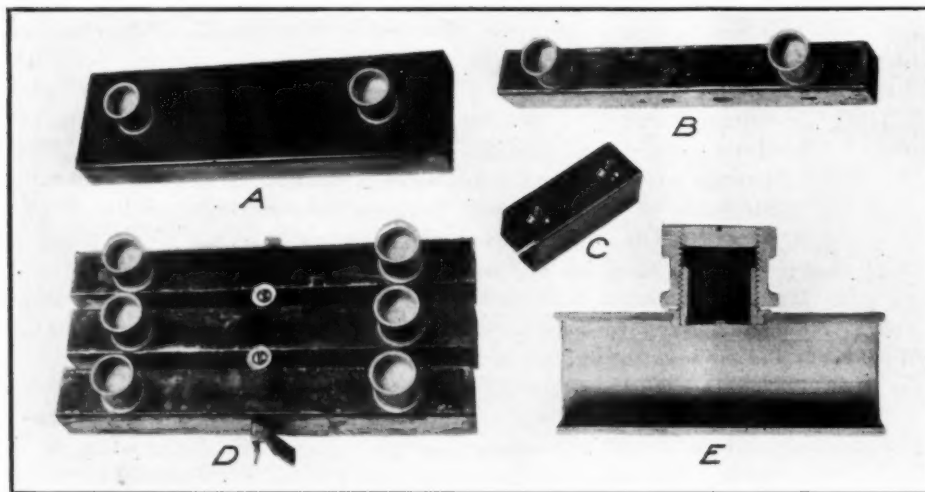


Fig. 3—Square Duct Types With Inserts

A—Special double size ducts to accommodate both telephone and low tension wire. B—Standard duct. C—Duct coupling. D—Method of spacing and supporting ducts. E—Cross section showing insert applied after duct is in place, inserts shown on A, B and D are of the preset type.

body after the ducts are in place. An adjusting ring is cemented into a groove in the cover with "smooth-on," and this ring finally receives the round flush cover plate. The assembled box provides three compartments completely separated from one another for wires of the three systems.

The system is especially designed for economical installation in buildings having a cinder fill on top of the floor slab, which is a type of construction very commonly used for the larger office buildings. The height from the top of the slab to the finished floor level is in common practice from 3 1/4 in. to 4 1/2 in. As shown in Fig. 5, the minimum height of the junction box is 4 1/4 in. When the dimension from top of slab to floor level is less than 4 1/4 in., the box must be sunk into the slab. This is a small matter when the slab is made of cinder concrete, as is the practice in certain cities, but becomes an item of some importance when the floor slab is hard concrete. In the latter case it would seem advisable to build into the slab at each box location a square section of 2-in. plank, about 2 in. longer on each side than the dimension of box.

The center of the ducts is 2 1/2 in.

two types, either plain without inserts, or with inserts permanently attached at the factory. The operation of tapping a duct of the first type is as follows:

The duct is first located by lining between two junction boxes. Office floors are almost invariably cement or tile of some kind. A hole about 1 1/2 in. in diameter is chiseled out down to the duct. A 1/4-in. pilot hole is then drilled on the center line of the duct, and a special tool, consisting of a hollow milling cutter with a 1/4-in. guide pin in the center is used to cut a 1 3/16-in. hole in the duct. A specially designed grooved brass ferrule is placed in this hole. The connection to the duct is made by means of a brass insert (see Fig. 3-E). A brass nipple forms the lower part of this insert, and the lower end of the nipple is accurately machined to a driving fit in the ferrule. The assembled insert is held in place and the nipple is driven into the ferrule with a few sharp blows of a hammer. This expands the ferrule and locks it in place in the duct. The threaded cap of the insert is then screwed up to the exact floor level and the hole in the floor is patched with cement.

Ducts may be obtained with inserts

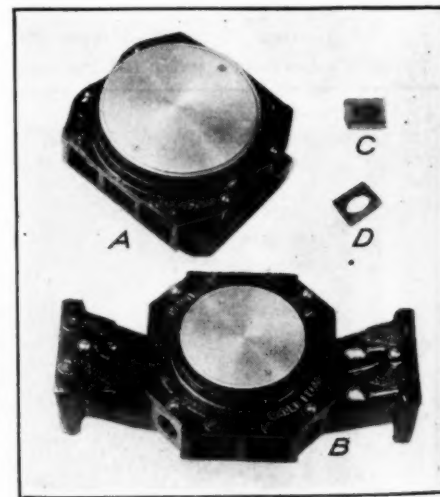


Fig. 4—Types of Junction Boxes

A—Accommodates three square ducts in one direction and three conduits at right angles. B—Box for two square ducts in one direction and two at right angles all to enter box at same elevation. C—Blank for closing an opening. D—Adapter for entering pipe into square opening.

ing on the side is generally used for telephone wires, and may also be used for other low tension wires. When a number of low tension wires are to be connected to a cable leading to a push button block on the desk, a stand-pipe may be used having a split head which will contain the splices. For 110-volt service, the standpipe terminates in a

split head carrying two receptacles designed to receive standard caps.

Layout

The chief points to be considered in laying out a system of this kind are the spacing of the duct lines and the capacity of the conduit systems feeding to the duct lines.

Most of the cases met with in practice will fall into one of two classes: First, space to be occupied by clerical workers and which may be utilized to capacity; and second, spaces which are intended for executive offices, such as the rooms occupied by the officers of a bank.

In a space of the first mentioned class, where the workers may be crowded as closely together as efficiency considerations will permit, the system will fall short of fulfilling its purpose if it will not provide service at practically every reasonable desk location. It may be assumed that the desks will be placed with their lengths at right angles to the outside wall. The duct

irregular or if there is some reason why the bay widths will not govern the location of desks and aisles, the rule may be followed of locating duct lines approximately 7 ft. apart.

A space of the second class mentioned above will always be much less densely populated than an area occupied by clerical workers. Two duct lines per bay, or in irregular areas a spacing of about 10 ft. between the duct lines will usually be found satisfactory. In any case, some study should be given to the problem by sketching probable desk arrangements in typical spaces.

In order to secure maximum flexibility, one junction box should be installed in each duct line in each bay, as shown on the typical layout. Some of these junction boxes are used as the feeding points of the system.

Two sets of plans were checked in order to learn the ratio between the area served and the number of "home runs," or conduits feeding into the under-floor duct system from lighting, telephone and low-tension cabinets. In

be, per 1000 sq. ft. of floor area on eleven floors, $\frac{3}{4}$ -in. conduit for 110 volt service, 0.75 home run, and 1-in. conduit for telephones and general low-tension wiring, 1 home run, these two being combined in this case. On one of the remaining floors the figures were 1.5 for 110-volt and 1.7 for phone and low-tension, and on one other floor, 1 for light and 1.5 for phone and low tension.

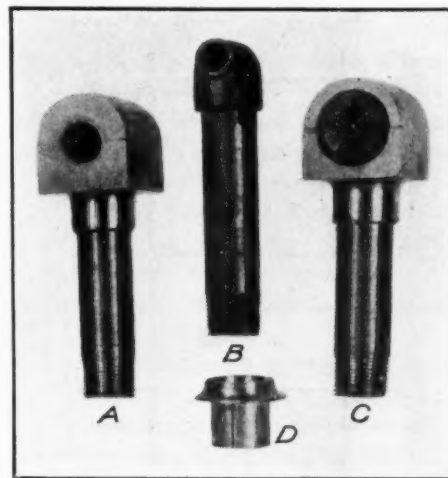


Fig. 6—Standpipes for Different Kinds of Service

A—For low tension with splice compartment on top. B—For either telephone or low tension wire where no splice is required. C—For 110 volt service. D—Split bushing for attaching standpipe to preset insert.

In all the above mentioned cases the floor area is only that served directly by the duct system, not the total area of an entire floor.

The large variations in these figures indicate that practice has not become standardized. The maximum service requirements should be amply covered by allowing, per 1000 sq. ft. of floor area, two $\frac{3}{4}$ -in. home runs for 110-volt service; two 1-in. for telephone; and one $\frac{3}{4}$ -in. for general low tension. When the space is not to be crowded full of desks, or when it is certain that all occupants will not require each class of service, corresponding reductions can be made in the number of conduits feeding into the system.

The tie-lines between junction boxes may, if desired, consist of the square duct instead of standard rigid conduit. This construction will provide a few more possible points where the system may be tapped for service, and will increase the cost somewhat. Whether or not the advantage gained is worth its cost is a point which should be carefully considered by the engineer.

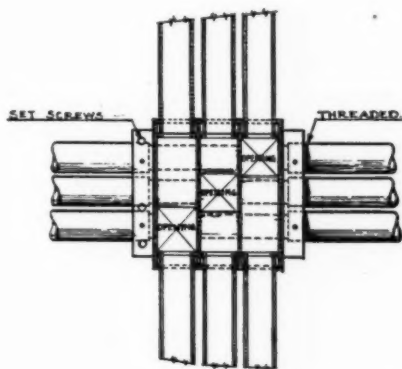
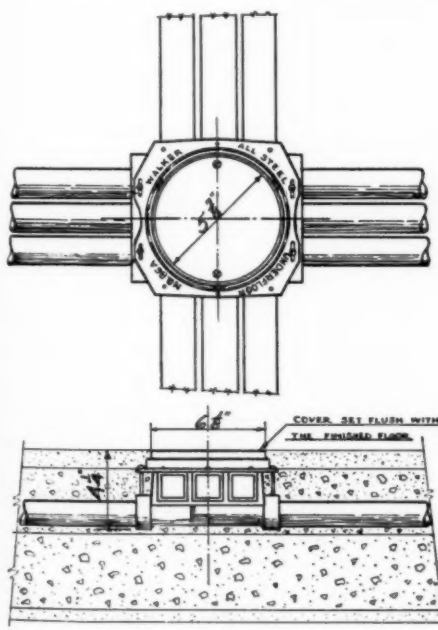


Fig. 5—Drawings of Junction Box

Above are shown box complete with cover to the left and same with cover removed to the right; below to left is cross section of floor showing box.

lines should therefore run parallel to the outside walls. The width of one bay from outside wall to column centers is usually from 18 ft. to 26 ft. To cover this floor area completely, three duct lines will be required, the term "duct line" being here used to mean a group of two or three ducts. One duct line will be located about 5 ft. from the outside wall, one 5 ft. from the column centers, and one in the middle of the bay. (See drawing of typical layout, Fig. 7). If the space is

a large office building built for rental, the number of home runs per 1000 sq. ft. of floor area were as follows: For 110 volt service, $\frac{3}{4}$ -in. conduit, 1.5; for telephone service, 1 in. conduit, 1.4; and for general low-tension service, 1 in. conduit, 0.6. An exception to the above figures was found on two floors, where the figures were, $\frac{3}{4}$ -in. for 110 volts, 2.2; 1-in. for telephone, 1.8; and 1-in. for low-tension, 1. In an office building erected by an insurance company for their own use there were found to

Labor Costs

On one large installation of this system, the junction boxes were all set in place by one crew, and another crew followed and installed the ducts, making it possible to obtain an accurate division of the labor between boxes and ducts. The time per box was 2.25 man-hours, which included locating the box, setting it in cement grouting at the proper level (a surveyor's level was used to determine the floor level for each box) and setting the adjusting

About $\frac{1}{2}$ lb. of "smooth-on" is required per box having six duct entrances. The duct is very readily cut with the hacksaws commonly used for cutting pipe.

To cut a hole in the finished floor, mill out the hole in the duct, place an insert and patch the floor required 20 min. for one man, or 33.3 man-hours per 100.

The total cost to the owners of this duct system in the building referred to above was approximately 20 cents per

and that after this experience they were willing to spend the money for the duct system in this building. Since the completion of the building they have found that the duct system adds materially to its rental value, and have expressed themselves as regretting only that additional duct lines were not installed in certain locations.

Radio Service Code Established in New York

At a meeting of the radio jobbers group of the Electrical Board of Trade of New York held on June 29, the report of the committee on service code for distributors was read and the following recommendations were approved, in an attempt to establish a common ground for service which all should recognize and which should be kept within its natural limits:

"That the dealer request for service on radio sets and accessories shall be based on the fact that he has made an inspection and an effort to place the set in operation, and has been unsuccessful. Under these circumstances on notification from the dealer, the distributor will issue return material tag for the return of the set or device for inspection and repair. If inspection proves that the set is not factory defective, the dealer will be so advised and the dealer will be charged transportation in both directions upon the return of the set. Or—

"At the option of the dealer, inspection may be made at dealer's store, provided that if inspection proves that set is not factory defective, it is recommended that the distributor will charge for this service at the rate of \$1.50 per hour, plus traveling expense, if any; time to apply from the hour when man leaves distributor's headquarters until completion of inspection. If inspection shows factory defect, the distributor will issue return material tag for return and repair, for which the dealer will not be charged. The distributor will not issue credit for sets classified factory defective.

"In cases where dealer claims factory defect and inspection shows tube, battery, hook-up, or other trouble, distributor will not replace defective tubes or batteries, but will notify dealer of trouble and advise how to correct same. The dealer will be expected to make necessary replacement of defective tubes or batteries."

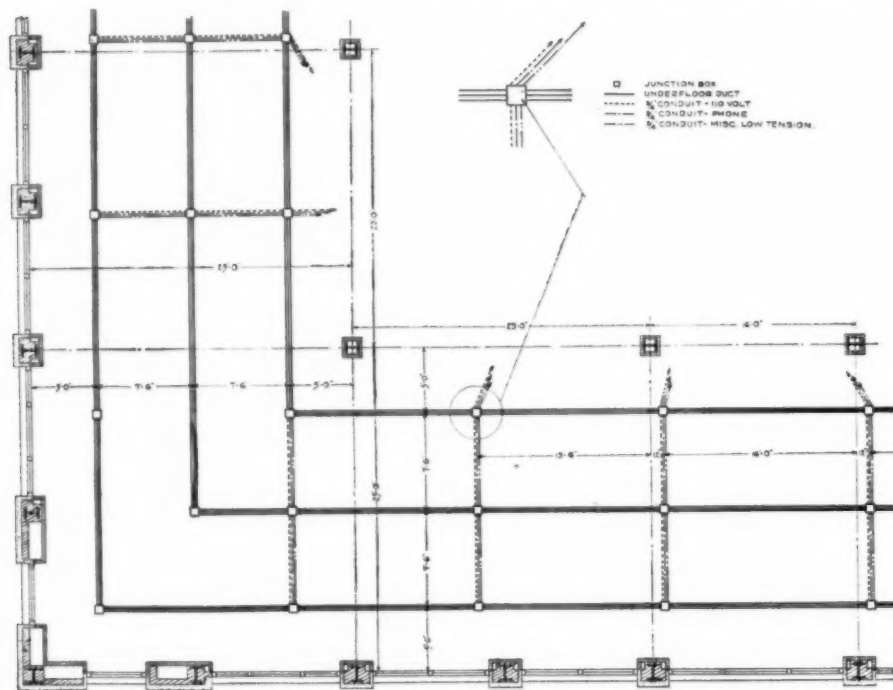


Fig. 7—Typical Layout of Duct System in Modern Office Building

ring in "smooth-on" cement. By doing all this at one operation, the job was finished so that the floor men could finish around the boxes without causing the electrical workers to lose any time and the boxes were kept clean and free from rubbish. The time for running the ducts and cementing them into the boxes was 2.1 man-hours per 100 ft. This work was all done by mechanics who had no previous experience in the installation of this system. This is the time for installing the square ducts only and does not include any labor on conduit for cross tie lines or feeds. The duct used on this job was furnished cut to exact lengths to fit between boxes. When furnished in 10-ft. lengths, as is now the practice of the manufacturers the labor will be slightly increased though the total cost of labor and material will be reduced. It is probable that the increase in labor will amount to about 0.4 hour per 100 ft. of duct.

square foot of floor area (this refers to area served by the system, not the total floor area of the entire building). Two duct lines were installed per bay in this case. It is estimated that the addition of a third duct line in the center of each bay would have increased the cost about 50 percent.

To the prospective builder with no previous experience in owning and operating office buildings, this may seem a considerable investment. The electrical contractor who is familiar with the conditions existing in old office buildings will realize that the saving in subsequent expense and in damage to the building, and the elimination of unsightly, unsanitary and hazardous exposed wiring, make this investment worth while. It is a significant fact that the owners of the building from which these costs were taken have for a number of years owned and operated two other large office buildings,

Reinspection in New York City

Sixty Percent of Electrical Equipments Inspected Found Defective Due Largely to Unauthorized Additions, Overfusing and Carelessness

By JOSEPH C. FORSYTH,

Chief Electrical Inspector, New York Board of Fire Underwriters

OVER ninety percent of the loss caused last year by fire from electrical causes in New York, \$350,375.84, was either directly chargeable to improper maintenance of electrical apparatus or to alterations and extensions made without the knowledge or approval of the underwriters' inspection department.

Other years showed similar conditions, and it was apparent that if a further reduction was to be made in losses from electrical fires it must come as the result of some effort to maintain existing electrical equipments in a safe manner—in other words reinspection.

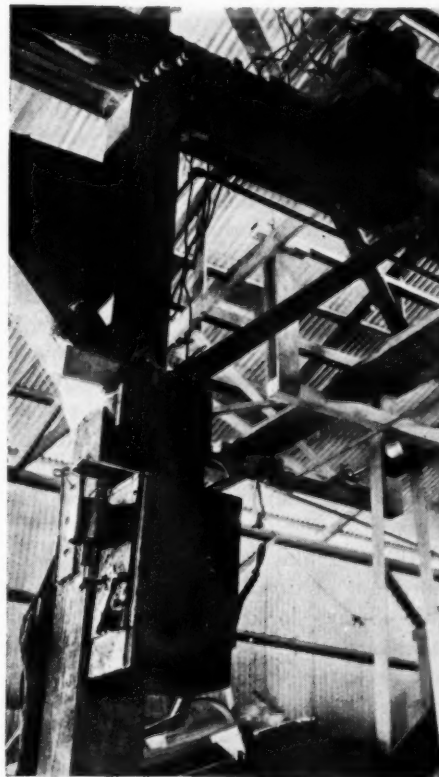
Careful inspection of new work has proven its usefulness—the losses from fires of electrical origin in New York in places where the equipments were in satisfactory condition at the time of inspection amounted last year to but \$37,174, an insignificant amount in comparison with the billions invested here in improved property.

With us of course reinspection is purely a matter of reducing insurance losses from fires. That is our job. We are maintained by the combined insurance groups.

Nevertheless, the work we do in re-inspecting existing equipments is of great importance to the electrical contractor.

When one of our inspectors finds a faulty electrical installation the fault has to be corrected and that means work for the contractor. Not only that but a methodical and regular reinspection service would tend to discourage owners from trying to do their own electrical work or from hiring incompetent, unauthorized persons.

We are not yet engaged in reinspecting in a large way. So far we have been feeling our way along to see whether or not the work was really worth while.



Courtesy N. F. P. A.

What the Inspectors Find

Upper—Live fuse block and snarled wire.
Lower—Defective wiring from starting box to motor.

Last year our men completely reinspected 4,042 buildings and 13,974 equipments. Of these, 8,379 equipments or 60 percent were defective.

The contractors will be interested to

know that 5,252 of these defects were corrected.

When the owner does not correct the fault our only recourse is to bulletin the building so that the fire insurance companies will know the condition of the risk. We have certain designations to show the relative degree of danger of the risk.

The insurance companies carrying a bulletined building then communicate with the owner and offer him the opportunity of correcting the fault or of paying a substantially higher premium. Generally speaking he pays.

Last year 1,170 buildings were bulletined and 624 bulletined buildings were corrected.

We have to be very careful on reinspection work. Because so many equipments complied with the Code as of the time of installation and are still good judged by the standards of that time, we are not able to make any standard for reinspection. Our only guide, therefore, is the judgment of our best men that the work inspected either is defective or not. In other words an equipment judged defective is plainly defective beyond a shadow of a doubt.

Our method of picking buildings for reinspection is simple. We take a map of the city, mark off the high valued risk sections and go over them first.

The high valued risks are usually in office building zones, loft and storehouse sections, large apartment houses, etc. Department stores and churches are also carefully inspected.

Contractors may perhaps be interested in knowing the chief causes for a violation being placed on existing equipments. The fault we find most prevalent, is without doubt the misuse of flexible cord. The contractor would be surprised if he were able to see some of the ways people use flexible cord and

CLASSIFICATION OF ELECTRICAL FIRES IN NEW YORK IN 1924

These fires may be classified as follows:—

	FIRES	LOSSES
Contacts defective	12	\$26,560.00
Current entering building over metal conduit, etc. to interior ground connection	12	1,779.62
Fuse, operation igniting adjacent inflammable material	7	.....
Fuse operation (neutral of 3 wire branch circuit)	1	.....
Flexible cord, short circuits and grounds.....	27	95,685.00
Grounding of conductors in conduit or in contact with other metal work.....	41	6,145.00
Grounds: Due to moisture.....	15	855.00
Heaters, warmers or pads, left in circuit.....	16	5,602.58
Lamps: Incandescent, ignition of inflammable material	23	7,465.00
Motion picture film, ignition at machine in booths.....	6	550.00
Motion picture film (miniature type machine not in booth)	3	235.00
Motors, sparks from	25	7,091.88
Motor and generator windings.....	46	71,835.00
Pressing irons left in circuit (91 in 1922) (68 in 1923)	126	94,394.25
Radio receiving equipment, lightning.....	2	65.00
Radio receiving equipment, short circuit of leads from storage battery.....	8	2,180.00
Services: of Illuminating Co. overhead.....	21	.....
Short circuits, accidental.....	37	19,751.48
Short circuits in elevator cables.....	7	875.00
Short circuits in sockets.....	7	560.00
Splices defective	52	3,935.00
Transformer insulation breakdowns, in vaults.....	13	.....
Volatile liquid or fumes.....	16	24,500.03
Automobile storage cell short circuit.....	2	525.00
Rheostats defective	2	60.00
110 Volt D. C. Current used for Burglar Alarm Systems	2	50.00
Short Circuit of switchboard buss bar.....	2	14,200.00
Short circuit of conductors in wood moulding by moisture	1	50.00
		\$387,549.84

expect it to pass the inspector. It is carried around base boards, stretched across ceilings, sunk in door jams and even hidden under carpets where everyone walking across it will damage it so that trouble is inevitable. This is by far the most common fault we find and the men have come to look for it first.

Next, I should say, comes over fusing, running a good second to the violation previously mentioned.

The safety valve of an electrical installation is the fuse. I have some data at hand that was collected a short time ago on fusing conditions which might be of interest. It covers residences, apartments, stores and factory lighting and motors.

The figures are well worthy of study and doubtless show a condition that is common in other cities as well as New York.

Residences were found with 60 percent having 10-amp. fuses, 30 percent having 15-amp., and 10 percent of 20-amp. capacity. The mains were found to be normal.

Apartments were found to have 90 percent of 10-amp. capacity, 5 percent of 15-amp. and 5 percent of 20-amp. capacity. The mains here were also found to be normal.

In stores however a different condition was found to exist, 10 percent being of 10-amp., 10 percent of 15-amp;

10 percent of 20-amp., and 70 percent of 30-amp. capacity. The mains were found to be only 10 percent normal, 20 percent were over fused and 70 percent were bridged.

Factories were found to be not far different, 20 percent being of 15-amp., 20 percent of 20-amp., and 60 percent containing 30-amp. fuses. Here too the main conditions are interesting, 10 percent only were normal, 40 percent were over fused and 50 percent were bridged.

Direct current motors showed that 30 percent were normal and 70 percent were over fused; while A. C. motors showed only 10 percent were normal, 60 percent being over fused and 30 percent bridged.

In third place I would put the deterioration of insulation on conductors. We always look for this and almost always find it. Wires are often placed where water or acids can drip on them and ruin them. This is especially true in elevator wells where the amateur has rigged up a lighting system and the wires drag in the pools of water that always accumulate in these places. Wires are also found in places where they come in contact with moving objects and the insulation is soon scraped off. This is not uncommon and is found in lofts, storehouses, etc.

An analysis of the 532 electrical fires which caused a loss last year in New York of \$387,549.84 is given in the

accompanying table 90 percent of which has been stated was due to improper maintenance or unapproved alterations and extensions.

This obviously is due to the tampering with existing wiring by office boys and others who have no knowledge of electrical safety and the way to maintain it.

Janitors, housewives and even school boys seem to think that the only thing to be careful of in wiring is that two bare wires do not touch, and when my men find poor work that is unsafe and want to have rectified a debate sometimes follows.

In the majority of cases I am glad to say that I find owners and contractors glad to live up to the letter of the law regarding electrical safety. It seldom happens that we have any serious difficulties and in every case we have found that a sensible discussion of the trouble with the persons responsible will generally end with the work being done to the satisfaction of the insurance companies.

Cleveland Electrical League Had Active Six Months

The first six months of 1925 were the most productive in results achieved in any similar period in the history of the Electrical League of Cleveland, according to a report of that organization just published.

Among the activities carried on was the origination of the idea of the league exhibit, "The World's First Exhibit of Everything Electrical for the Home," which was put into effect and carried out at the league headquarters in the Hotel Statler. It was started May 16 and is still under way at the present writing. The exhibit includes, wiring, lighting, fixtures, appliances, etc.

The lighting section committee also started a direct-by-mail advertising campaign, circulars going to over 2,000 merchants monthly in the interests of better lighting.

The Nela Park lighting school session was carried through for league members and voted a great success, as were the efforts of the wiring section committee in holding meetings for contractors in various parts of the city.

W. R. Brookins and H. G. Leavell, wiring experts of the league made a total of 768 calls and were active in increasing the number of outlets from 3,142 as shown in original plans, to 5,642.

The Cost of Bending Large Conduit

Survey Brings Out Data on Labor Times to Bend 1 1/4 inch and Larger by Many Different Methods

THERE appears to be no standard practice among electrical contractors for bending 1 1/4 in. conduit and larger.

Some insist that to purchase manufactured elbows and bends is much more economical than to make bends in large conduit, although a few will bend up to 3-inch but no larger.

Some make bends on the job through a hole in a wall or a plank or whatever else is handy. Others are equally strong for benders either of their own design or standard machines on the market.

Every now and then this organization receives an inquiry for data on large pipe bending—cost and method. Because of the interest, a questionnaire was sent to a limited number of progressive large contractors and from their replies the accompanying data have been compiled.

As this inquiry was intended to de-

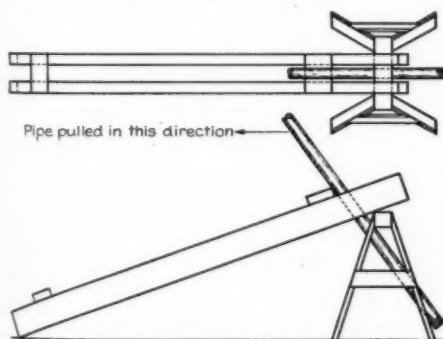


Fig. 1—H Frame and Horse Method

velop data on the operation of bending no time will be taken up with manufactured elbows, fittings and pull boxes except to say that this method has such strong exponents as E. McCleary, McCleary-Harmon Co., Detroit; A. Kahn, Blumenthal-Kahn Electric Co., Baltimore; A. B. Harris, Light-house Electric Co., Gary, Ind.; O. F. Wadleigh, Sanborn Electric Co., Indianapolis; A. Marzell, Laube Electric Corp., Rochester, N. Y.; A. L. Cope, Cope Electric Co., Alliance, Ohio; A. N. Walter, The Roland Electrical Co., Baltimore, and others.

In bending pipe much of course depends on whether the bend is to be exposed or concealed. If concealed there is not the necessity for great precision. On exposed conduit work where there are a number of parallel bends more time is required in order to make all bends as near alike as possible, particularly where such methods as bending over the draw bar of a freight car, between two trees or through a hole in a wall are used.

There are, however, still a number of concerns who bend pipe on the job with whatever suitable fulcrum they can find such as freight cars, two trees close together, a hole in the wall, telephone pole and wall, etc. Where there are perhaps only one or two offsets to be made these methods are more economical than setting up a bending machine, which may take a lot of time, unless the offsets could be made at the shop. On the whole, however, the time lost in hunting for a suitable place where bends can be made is rather expensive with present labor costs.

In using these about-the-job methods one man can as a rule bend pipe up to 2 inches; but for larger sizes two or more men are generally required.

Where such natural fulcrums are not available a common practice is to wedge a heavy plank between the floor and ceiling, bore a hole through it and bend the conduit at that point. Sometimes this is set up straight and sometimes at an angle.

Home Made Bender

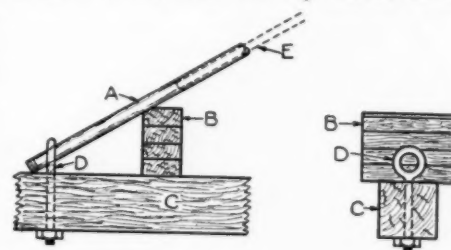
A number of concerns set up a simple bending apparatus of their own design on each job. Generally this takes but a few minutes to make—less time according to one concern than it takes to hunt up a suitable about-the-job place and then travel back and forth to it.

An H-frame of heavy timbers and a horse, Fig. 1, are used by the Keller-Pike Company, Philadelphia. J. W. Goheen, vice president of the company, gives the following actual times (not

including time to set up apparatus) for bending large sizes with it:

1 1/4 in. conduit, 2 men	10 minutes
1 1/2 in. " 2 "	10 "
2 in. " 3 "	15 "
2 1/2 in. " 4 "	15 "
3 in. " 6 "	20 "
3 1/2 in. " 6 "	25 "
4 in. " 6 "	30 "

The scheme used by Huntington & Guerry, Greenville, S. C., is shown in Fig. 2. A forged eye bolt of 1-in. iron and a 4-in. eye, which the wireman carries in his kit, is inserted in any available scrap of heavy timber. A block with a V-notch at the top serves as a



A=Conduit up to 2".
B=Blocks of Wood, top one having a "V" notch.
C=Timber, any size, 6"x6" or larger.
D=Forged eye bolt of 1" iron. Eye about 4".
E=Shafing for additional leverage for larger sizes.

Fig. 2—Eye-Bolt Method

fulcrum. For sizes above 2-in., heavier timber and blocking are used and instead of an eye bolt run through the timber, a heavy log chain with short links is wrapped around it. The log chain, according to J. H. Howard, secretary of the company, has a gripping effect on the pipe which prevents it from turning and permits offsets to be crowded very close to each other and at any desired angle.

Where particularly close work is required in the larger sizes a piece of shafing is inserted up nearly to the block as shown by the dotted line. This gives greater leverage.

The time to make a bend with this method is a matter of skill and judgment of the workman. A good man, it is stated, can easily make a complete two bend offset in 1 1/4-in. conduit in from 2 to 3 minutes. Where the offset

is complicated, Mr. Howard states he lays it off full size with chalk or crayon on some flat surface near the bender and then it is seldom necessary for a skilled workman to make more than two trials at any reasonable offset.

The most satisfactory method of making offsets and sweeps in heavy pipe, according to George L. Fiske, Clarke & Miller Electric Co., Boston, is to bolt two heavy planks, Fig. 3, in an upright position and about 2-feet apart with a 10-inch pulley (groove 3-in. radius) fastened about 3-ft. from the

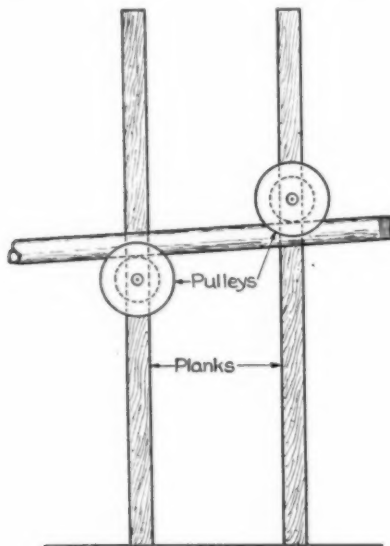


Fig. 3—Two Pulley Method

floor on one plank and about 6-in. higher on the other. The pipe is passed over the lower pulley and under the upper one. If the leverage is insufficient a length of the next larger size is slipped over the end. The precision of the work depends upon the skill of the individual workman.

Offsets in 1½-in. and 2-in. conduit, made through an opening in building brick work, take from 15 to 30 minutes, according to data furnished by George Weideman, George Weideman Electric Co., Brooklyn, N. Y., while saddles take one hour. On 3-in. and 4-in. conduit offsets require 1½ hours and saddles 2 hours.

The time required to bend 1¼ to 2-in. pipe by hand, using the iron girders of the building, according to James R. Strong, Tucker Electric Co., New York, is on the average 30 minutes for man and helper. This company by using a machine bends 2½ and 3-in. pipe in the same time.

L. R. Greusel, Central Electric Co., Battle Creek, submits the following data

on labor using railroad car: 1½-in. one man, 3-in. two men; time, 1¼-in. to 2-in., a few minutes to 2 hours, 2½-in. up, half an hour to four or five or even eight hours.

For pipe up to 2-in. L. K. Comstock & Co., New York, according to J. E. Metzger, have developed a bender which takes three hours to erect but which will turn out elbows in any length desired for between 5 and 15 cents a piece for labor after erection.

Iron City Engineering Co., Pittsburgh, Pa., of which A. M. Cover is manager, has developed a light weight bender of the screw type which takes up to 6-in. Time ranges from three to four minutes for making 90 deg. elbows on 1¼-in. conduit to two hours for making 90 deg. elbows of a 38-in. radius in 6-in. conduit.

Five minutes for a journeyman and helper to make a bend in 1¼-in. pipe with a Fountain bender; 8 minutes for 1½-in. pipe and 15 minutes for 2 in. are reported by J. C. Hatzel, president, Hatzel & Buehler, New York. For larger pipe this organization uses hardwood forms with the following times for a journeyman and helper: 2½-in., 30 minutes; 3-in., 35 minutes; 3½-in., 45 minutes; 4-in., 50 minutes.

Walter V. Pangborne, head of W. V. Pangborne & Co., Philadelphia, has a Watson-Stillman hydraulic machine which he sets up either in the shop or

on some big job that is in progress. With this machine the pipe is bent for the other jobs. This company has found that bending pipe on each job by putting it under some heavy weight is uneconomical, requiring sometimes the sending of five or six additional men to a job. With the machine but one man is required to make a full bend in 4-in. conduit. Mr. Pangborne states that the machine has been a labor saver.

Labor for making an offset, using some part of the building construction is given as follows by L. J. O'Donovan, president, Reis & O'Donovan, Inc., New York: For a journeyman, helper team, 1¼-in., 1 hour; 1½-in., 1¼ hours; 2-in., 2 hours; 2½-in., 2½ hours; 3-in., 4 hours.

Langdon & Hughes Electric Co., Utica, N. Y., uses an American bender on sizes over 2-in. The same machine is used by Ochiltree Electric Co., Pittsburgh, Pa., which states that a standard 90 degree elbow in 2-in. pipe takes 20 minutes for two men.

For 1-in. to 2-in. conduit Hixon Electric Co., Boston, Mass., using a machine made by the same company, will bend with two men an average of 30 elbows per hour. Elbows when formed are of the following lengths from the back of the ell to the end of the thread: 1-in., 10 inches overall; 1¼-in., 12 inches overall; 1½-in., 15 inches overall; 2-in., 20 inches overall.

Is Standardization of Motors Being Carried too Far?

"STANDARDIZATION has aided the electrical manufacturing industry of this country in the direction of reduction of costs, and this reduction in costs has been immediately passed on to the buying public, with no apparent gain to the industry itself except as may accrue through increased volume and resultant reduction of cost. Standardization is having a far reaching effect which was not contemplated at the time of its inauguration. There is an effort on the part of certain elements of the buying public to still further standardize in the direction of mechanical dimensions of electrical apparatus, thereby producing a still further leveling operation which may eventually result in the elimination of all special qualities and characteristics. This brings us face to face with the question—can standardiza-

tion be carried too far? In the mind of the writer the answer is unquestionably, yes. If standardization is carried to the extent that it stops progress in the art, it is certainly harmful. If it is carried to the extent of putting all apparatus on the same level, there would remain only one further element of standardization, and that is, standardization of price. I do not mean to suggest that this standardization would be through cooperation or agreement among manufacturers, but with the present excessive manufacturing capacity in this country the selling price will naturally come to the same level if there is no difference in the apparatus, or the smaller and less well known organization will perish."—A. H. Timmerman, presidential address, *The Electric Power Club, Hot Springs, Va., May 25, 1925.*

Sell the Customer What He Wants: Light, Not Fixtures

By ARTHUR H. FORD

Professor of Electrical Engineering, State University of Iowa

THE window of a realtor in a Florida city contains a card bearing the inscription "We sell you the dirt. God gives you the sunshine." While the light of the sun and the moon are the gift of God, the human race is not content with only such light as it has as a gift; but extends its hours of work and recreation by creating artificial light. The light of primitive man was furnished by the bonfire which served to warm his cave and keep the wild beasts at bay. The liking of man for this kind of a light is so ingrained into his being that we still provide for the building of bonfires in our homes by the construction of fireplaces; even though we are kept warm by the heat from radiators filled with steam. The fireplace has little utility as a source of heat; so it must be considered as adding to the cheerfulness of the room by the light which it gives.

Until the advent of the electric lamp, all our artificial light came from some form of flame. The following light sources may well be noted in passing: the pine knot; the oil lamp of the ancients, which consisted of an oil receptacle provided with a wick for feeding

the oil to the flame; the candle of our immediate forefathers; the kerosene lamp of our youth, which had a way of going out, from lack of oil, when we called on our best girl; the gas jet of the larger cities, with its later modification to the mantle burner. All of these devices required labor for their construction and maintenance, and for furnishing the supplies that they consume. The devices were sold as light giving devices, but they were purchased for the sake of the light which they gave. One party to the transaction was buying light and the other was selling devices as such, with the result that there was complaint from the buyer that he was not getting what he paid for.

Consider the Plumber

The electragist who sells wire, conduit and switches to his customer rather than light is not living up to the possibilities of his vocation. The writer often hears electragists bemoan the fact that their ways are not the ways of the plumbers; rather let them be thankful that they have not adopted the business methods of the plumbers, which have made them a reproach among those who have buildings constructed.

Having mentioned the plumber it may be well to consider what the plumber sells to the householder. Does he sell pipe and plumbing fixtures only? Oh no. He sells certain necessary utilities; a sink for the kitchen and a closet, a bath tub and a lavatory for the bathroom. If he is enterprising he sells conveniences in addition to the above necessities. These conveniences are lavatories for the bedrooms and a water softener or a pump to pump soft water from the cistern. These are sold on the basis of their utility and not as plumbing fixtures and pipe.

Where does the householder go to buy an automatic electric pump? Does he go to your place of business or that of the plumber. He probably goes to the plumber, who employs you to connect it up to the electric supply of the house, while he pockets the profits of the sale. Should the outfit be divided at the motor coupling and the cost of the two parts of the appliance and its connections be determined, the cost of the electrical part would be found to be the greater. The plumber sells the device because he has learned to sell service, which art the electragist has still to learn. The elec-



What a little thinking on the lighting problem will do. How many people do you suppose the customer on the left will send to the contractor who put in that job?

tragist has no competition when he sells light; for everyone now concedes that there is no light source equal to the electric lamp, either from the standpoint of convenience or efficiency.

The supplying of artificial light having been conceded to the electric power service company and the electragist, because they can supply the service at the lowest cost, quality considered, the question arises: Why make an effort to sell more service than the customer demands? The answer is that there is competition within the industry and the trade and the profits go to the person who sells what the customer wants and gives the best service.

The established electragist is no better than the "curbstoner" if all he sells is wire and electric fittings. When the factory manager comes to you and says he wants his factory equipped with electric lights, do you make a study of his factory and determine the character of the work done so as to be able to calculate the amount of light needed; or do you merely distribute the outlets uniformly over the ceiling and supply lamps consuming a watt or so per square foot of floor space? When you buy a horse you do not buy it on the basis of the quantity of feed which it consumes; neither do you buy an automobile on the basis of the amount of gasoline which it uses.

Measure the Light

If you are wise you will go to the factory with a foot-candle meter in your hand and will measure the daylight illumination at the different working places and compare this with the illumination that has been found to be necessary for efficient work. By doing this you can frequently get a chance to practically reconstruct the lighting system, when you were called in to make only a slight addition. In order for you to do this it will be necessary for you to know that the output of a factory can frequently be increased by as much as 20 percent by an additional cost for light of only 2 percent of the payroll. Measurements of illumination were formerly of the nature of refined laboratory experiments; but are now easily made by the use of a portable meter weighing only four pounds and costing \$25.00. Though much of the information needed for the planning of an illumination system is published by the electric lamp companies and may be had for the asking, many electragists

regard this as "high brow stuff" which is of no use in their business.

Most of the new business at present is from the builders of dwellings, which can hardly be considered as factories, except as to the kitchens. Many power companies have found that kitchen lighting units can be sold to a considerable percentage of their customers, on the basis of the improved lighting. They have hired electragists to hang the units and have pocketed the profits on the sale, as well as those on the increased energy supplied. The electragist probably had similar or identical kitchen units in stock; but was trying to sell them as lighting fixtures instead of demonstrating the illumination produced when they were hung in his customers' kitchens.

When selling electric equipment for the rest of the house, light must be sold both on account of its utility and its decorative features. Coming back to the illustration of the bonfire of the cave-man, the light source is the center of attraction. This requirement demands local lighting, as contrasted with the general lighting of a shop or office. The lighting unit should be portable, so that its location can be made to conform to the arrangement of the furniture which happens to suit the housewife at the time. This requirement of portability gives rise to the misnomer of a portable electric fixture; hence the adoption of the term luminaire, by the Illuminating Engineering Society, as a designation for any lamp support with its shades and reflectors. The larger number of portable luminaires used, the greater demand for convenience outlets and the more business for you in wiring a new house or extending the wiring of an old one.

Selling the Women

The women of the country are already sold on the use of portable luminaires and should be easily sold on the idea of the convenience outlet. No one likes to have the appearance of a room marred by a loose drop-cord extending from the central luminaire to the picture mould and down to a portable luminaire. This chance for increased business has been overlooked by most electragists.

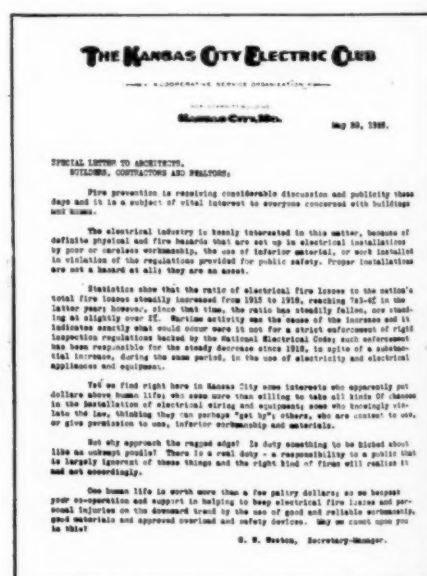
While local lighting usually gives the best effort in the home, there are times and places for the use of general lighting. Every room should therefore be

equipped with either bracket or ceiling luminaires. These should be of artistic design as well as efficient distributors of light, and should harmonize with the furniture. Fashions in furniture change; which statement applies to the luminaires as well as the rest of the furniture in a room. The requirement that the luminaire shall be efficient as a lighting device necessitates the use of shades, even with frosted bulbs. Many luminaires are designed for decorative purposes only and will make dissatisfied customers if they are sold for use in places to which they are not adapted. Customers must be guided in their choice of luminaires, for few know anything about the principles of illumination.

To sum up the matter in a few words; the customer wishes illumination and therefore the electragist should sell luminaires and wiring appliances in terms of illumination rather than in terms of their structural excellence or the price.

Fire Prevention

The following letter was recently sent out by the Kansas City Electric Club, in the interests of fire prevention, to over 300 architects, builders, general contractors, construction companies and realtors.



It is No. 11 of a series and is the first in several months to deviate from "better home lighting" the subject of the others.

The letter is self explanatory and resulted in considerable publicity for the club.

Low Voltage Problems

BY C. H. MOULTON

Manager, Signal Systems Division, Connecticut Telephone & Electric Co., Meriden, Conn.

LOW voltage work—the occupation from which electrical contracting sprung—offers large opportunities to the contractor who will take the trouble to keep informed. Generally speaking the low tension work is let on a separate electrical contract.

The impeding conditions which in the past have discouraged more than one contractor can be overcome. They are:

1. General inattention given to the subject in technical books, educational courses and the technical press.
2. Low price competition.
3. Incomplete specifications.
4. Guarantee clauses.

The electrical contractor may not be able to find what he is looking for in technical books but he can secure from the manufacturers all the technical data that he will require. From publications like THE ELECTRAGIST he can secure data on proper methods of installation and labor cost data.

Price competition can be met with salesmanship, quality equipment and service. Low tension equipment is installed for reasons that make its continuous operation paramount. Imagine a fire alarm system breaking down or becoming inoperative at the time of a fire. Think of the pain and suffering that would be caused and perhaps loss of life, if a hospital signaling system were to cease functioning in whole or a part, particularly the latter because it might not be noticed for sometime.

In low tension installation therefore, the electrical contractor has the opportunity to sell quality materials and workmanship in the face of lower prices, but he must be informed.

Specifications should be a protection to the installer as well as to the owner, yet how often do we see one reading somewhat as follows:

"There shall be a telephone system installed, connecting the various rooms, with batteries for proper operation—wiring to be of sufficient size."

How vague this is. If followed, it simply means that the lowest priced product goes into this building to the

disappointment of the owner and the final dissatisfaction of the architect.

The architect as a rule insists that the products which go into a structure shall measure up to certain standards. Where, as in the case just quoted, he does not, it is due largely to insufficient information and not to any desire to skimp the job. As a rule it will be found the architect or engineer will welcome suggestions.

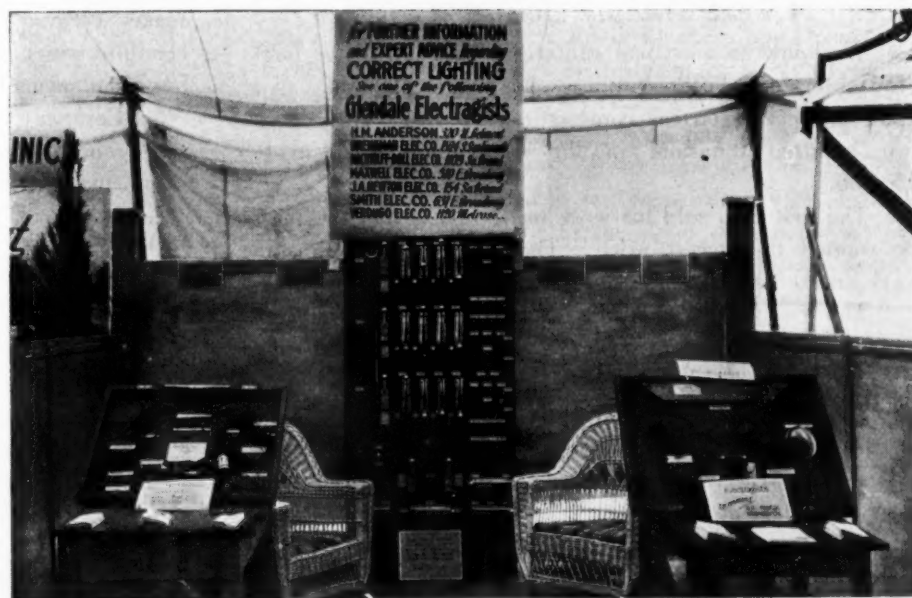
In fairness to all contractors bidding, specifications should be complete when proposals are submitted. If, however, they are incomplete the contractor could assist in bettering conditions, by having an elaboration of the specification accompany his bid to make it more complete. This would go a long way toward competing successfully with the "price" bid.

More serious thought is likely to be given the selection of apparatus and more attention to the details of installation by the use of the clause "The system shall test free and clear from grounds and be maintained without additional cost for a period of one year from date of acceptance."

Such a clause is not unfair because the system should measure up to that requirement. How often, however, have contractors seen their profits go a skidding in the cost of maintenance because the system, though installed in accordance with specifications, was inadequate to meet the requirements of the customer.

A "penny wise pound foolish" policy of purchasing does not work out satisfactory and particularly so in low voltage installation.

Glendale Campaigns for "All Metal"



AN "All-Metal Standard" exhibit was shown by the Glendale members of the California Electragists at the local Merchants' Exposition held from June 19 to 30, as preliminary to an effort to make the city "All Metal."

A petition to the City Council will be presented at an early date, asking for change in present ordinance to call

for "All Metal" installation in all parts of the city of Glendale.

The principal feature of exhibit in addition to showcards with short snappy sayings was the display showing defective materials and parts from buildings in which they had caused fires.

Literature explaining the benefits of "All Metal" was passed out.

The Electragist

Official Journal of the
Association of Electragists—International

S. B. WILLIAMS
Editor

ALFRED BATSON
Associate Editor

Another Crop

In a recent news letter, the National Fire Protection Association requests members to urge newspaper men to feature causes specially in writing reports of fires. The letter states that where this has been tried out, definite educational values have resulted.

This is a good idea. It will probably result in a larger crop of "electrical fires." But if it results in making the public more respectful of electrical installations, the means is worthy of the end.

The public must be taught that electricity is not fool-proof. When installed properly, it is safe as safe can be. When installed by amateurs and other unauthorized and incompetent people it is decidedly dangerous.

Cheap Is That Cheaply Does

We know an electrical contractor who did a five hundred thousand dollar volume and made \$20,000. We know another electrical contractor who did a little over two hundred thousand in the same time and made \$30,000.

The first man sold his work on the basis that the public wanted the lowest price. The second man sold his work on the basis that the public wanted maximum service.

The first man worked day and night to keep track of the great volume of business. The second man found time to play.

It's just the same whether one is selling wiring or appliances. A big volume gained at the expense of reasonable profit earns less reward and takes more labor than a quality product at a reasonable margin.

A cheap eighty-nine cent curling iron may have a twenty-five cent margin, while a four-dollar iron will have a margin of \$1.20 to \$1.40. How many eighty-nine cent irons must one sell to equal the profit on one four dollar iron? How much more sales time must be spent? Complaints answered? Stock space taken for which rent is paid? etc.

It takes a good man, a fast man and a busy man to earn a net profit on a cheap line.

It takes a clever contractor to earn a net profit on low priced work.

Cheap is that cheaply does.

Watch Out For This One

An organization representing a national manufacturer has sewed up a number of electrical contractor-dealers in a proposition the full significance of which was not understood until it was too late. For obvious reasons it is not possible to give names but the following facts are presented to those of our readers who might be approached in this manner:

The dealer is given the exclusive representation in that locality for one year and he signs a contract. He orders what is apparently a standard shipment costing him around \$700 which he agrees to pay for in 60 to 90 days. In one case, at least, trade acceptances were taken and discounted with a finance corporation.

In making this agency arrangement the distributor makes certain agreements for taking back unsold merchandise which in each case that has come to our attention has been misunderstood. One such contract stated:

"Company agrees, by special effort, to sell or cause to sell, goods listed above within 60 days from arrival of shipment, or will take back at price shown hereon and in accordance with the period of this Agency Agreement, any such goods remaining unsold."

In each case the company does send a demonstrator but in the cases that have come to our attention no goods were sold. Then when the dealer tries to return the goods he finds the distributor taking refuge in the terms of the contract and will not accept any returns until the agency agreement has expired at the end of one year.

No cases have come to our attention where a year has elapsed and the dealer has returned the goods.

There are a number of reputable electrical distributors who actually do place a stock of merchandise in a dealer's store and then send a special crew into the town and sell it for the dealer. The theory that the distributor operates on is that the dealer is well known and has good will and this is of advantage to a product little known.

In the case in hand, however, the dealer is led to believe that the distributor will either sell the goods with special salesmen in 60 days or else take back those unsold.

There is nothing apparently illegal about the transaction in any way because the distributor appears to be abiding by the printed contract.

So many dealers, however, have gone into this only to wake up to its true significance when it was too late that a word of caution is here given not to sign contracts for such agencies unless everything printed on the contract is absolutely clear and also unless you have first checked up the credit responsibility of the company offering the contract.

Those who have these contracts are now wondering if the distributor will be financially able to reimburse the dealers for the merchandise at the end of the contract year.

Are We So Bad Off After All

"This is a rotten business, electrical contracting and dealing. You can't make any money in it. Now if we were only in the hardware business, etc., etc." to quote from hundreds of electrical contractor-dealers.

A few days ago we received an analysis of the margin, expense and profit of the hardware store as made by the National Retail Hardware Association from the 1924 reports of 1,267 stores in 43 states. The figures are very illuminating.

Out of every dollar taken in 1924 by hardware stores 75.15 cents went to pay for merchandise, 21.88 cents went to expense (overhead), 2.53 cents for interest on investment, and 0.44 cent went into the bank as net profit.

Isn't it a wonderful business that brings a net profit of less than one-half of one percent?

If the average electrical contractor-dealer does, say, \$25,000 worth of business a year, to do as well as the average hardware store he would have a net profit of *one hundred and twenty dollars*.

The average hardware store volume last year was \$61,000 and the average net profit was less than \$300. A volume of \$61,000 is considered good in the electrical contractor-dealer business. Would a \$61,000 man be satisfied in our field with less than \$300 net profits?

The business of electrical contracting and dealing is not a poor one so far as businesses go. There are many who find that they cannot conduct a retail business at a profit because of inadequate margins. There are some who cannot make a profit because they do not know how to manage their business in such a way as to meet competition. There are some who do not know how to work for themselves.

It is true that there are many small one-man businesses coming into the field to increase competition. Every business has the same thing to contend with. In fact it is the small business that later grows into a large business.

Most of the very small ones die off, as is natural in all business, but those that have taken root thrive and when compared with other lines of business will be found to be doing very well considering the volume of business.

This business of electrical contracting and dealing is one to be proud of—it has great possibilities for profit.

Legislation Co-Operation

Why should it be so difficult at times for the electrical industry to secure the passage of suitable state and local laws regulating the installation of electrical wiring? Generally speaking the proposed ordinances are fair and represent good practice.

As near as we can figure there are two reasons for such trouble. The first is that the industry in many cases is not entirely back of the proposed legislation, and the second reason is the seeming desire of the electrical industry to go it alone.

The electrical industry is not the only interest affected by wiring regulation. If anything it is least affected of all.

Ordinances and state legislation are for the purpose of protecting the property and lives of the public. Therefore bodies of large public importance like the chamber of commerce, rotary club, civic improvement bodies and similar organizations interested in the economic and safety standards of the community are vitally affected. Their support is not difficult to win provided the situation is clearly explained.

With their support back of a bill the movement loses the selfish aspect it might otherwise have and much of the resistance to it will end.

It's always harder to play it alone.

Letting the Tail Wag the Dog

"Our companies exist to sell something to the public. We don't exist to sell irons and percolators and washing machines. That is merely an incident in our business. I sometimes think it might be better if no utility company dealt in merchandise of this character, for having to handle and sell appliances is very likely to give a wrong slant to our vision—very likely to divert our attention from the business itself. We exist to sell electrical service—to make electricity and deliver it to the point of use by the customer."—*M. S. Sloan, Chairman Public Relations Section, N. E. L. A.*

This is the point of view of a broad-minded central station executive who is looking ahead. The general central station appliance merchandising policy, however, is one of the seven wonders—so hard to understand. But 10 percent or less of the gross revenue comes from these appliance departments which for the most part are conducted at a loss. Except for some of the heating devices and refrigerators electrical appliances are not load builders.

Ten thousand washing machines might involve a million and a half dollars if they could all be sold in a short space of time. The customary utility practice seems to be time payments over a long period without extra financing cost. These 10,000 machines wouldn't add much more than 1000 kilowatt hours per week, if that, to the system which at 8 cents a Kw-Hr equals the large sum of \$80 a week.

If the utilities were to wake up to the true significance of their appliance merchandising business it might easily be that the situation would assume a complexion much more favorable to the contractor-dealer.

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Detroit (C)	N. J. Biddle	478 Penobscot Building	SOUTH CAROLINA	J. P. Connolly	141 Meeting Street
Grand Rapids (C)	T. J. Haven	1118 Wealthy St., S.E.	Charleston (L)		
Saginaw (C)	E. T. Eastman	209 Brewers Arcade	TENNESSEE		
MINNESOTA			Chattanooga (L)	P. W. Curtis	725 Walnut Street
Duluth (L)	Morris Braden	c-o Minn. Power & Light Co.	Knoxville (L)	Jerry G. Pason	303 West Church St.
Minneapolis (C)	W. I. Gray	209 Globe Building	Memphis (L)	J. J. Brennan	12-16 So. Second St.
MISSOURI			Nashville (C)	J. T. S. Lannon	c-o Electric Equip. Co.
Kansas City (C)	A. S. Morgan	4 E. Forty-third St.	TEXAS		
St. Louis			Beaumont (C)	J. A. Solleder	Houston & Bolivar Sts.
Electragists' Ass'n (C)	W. F. Gersner	120 No. Second St.	Dallas (C)	P. B. Seastrunk	2032 Commerce St.
Electric Employers' As- sociation (C)	G. L. Gamp	Wainwright Bldg.	Houston (C)	J. W. Read	715 Capitol Avenue
NEBRASKA			UTAH		
Lincoln (L)	George Ludden	1329 N Street	Salt Lake City (C)	C. Lamont Felt	18 West Second St.
Omaha (L)	Israel Lovett	c-o City Hall	VIRGINIA		
			Lynchburg (C)	J. L. Fennell	c-o Fennell & App
			Norfolk (L)	K. D. Briggs	227 Arcade Bldg.
			WASHINGTON		
			Seattle (L)	P. L. Hoadley	Seaboard Building
			WISCONSIN		
			Green Bay (C)	V. E. Grebel	531 S. Broadway
			Madison (C)	Otto Harloff	602 State Street
			Milwaukee (C)	R. H. Grobe	156 Fifth Street
			CANADA		
			Montreal (C)	George C. L. Brassart	674 Girouard Ave.
			Vancouver (C)	James Hart	323 B. C. Electric Bldg.
			Winnipeg (C)	Sydney F. Ricketts	76 Lombard Street

(C) designates exclusively Contractor-Dealer organization.
(L) designates an Electrical League.

JULY ACTIVITIES

Illinois Passes Enabling Act With Many Interesting Provisions

AN act enabling Illinois municipalities to regulate the installation of electric wiring has been passed by the State Legislature and was signed by the governor on June 30.

Illinois cities have been operating without wiring ordinance protection since the Supreme Court decision last October which held that the City and Village Act did not cover licensing of master electricians or the collection of fees for inspection.

Inasmuch as the Supreme Court at that time laid particular stress on specific wording saying that "Statutes which grant powers to Municipal Corporations are strictly construed," it might be interesting to mention certain provisions of the newly passed enabling act.

The act excludes from its provision, radio receiving apparatus and equipment installed by public utilities. Provision is made for an electrical inspection department of five members in each place, consisting of the commissioner or electrical inspector, a contractor, a journeyman and a representative each from the underwriters and the electric light company.

This commission may prescribe fees and standards which must be ratified by the municipal council with the following provision: "In any municipality which has established an electrical department the standards for installation and alteration of electrical equipment, except as any local commission may otherwise determine, shall be those established from time to time by the National Electrical Code."

Contractors are required to be registered and to pay a fee therefor of not more than \$50, an electrical contractor being "any person, firm or corporation engaged in the business of installing or altering *by contract* electrical equipment, etc." with the express provision for experience and knowledge by a *member* of the firm stating that it does not include "electricians employed by such contractor to do or to supervise the work."

However, the phrase "by contract" does not apply to or include electrical equipment installed or altered by a person who bears the relation of employee to the person for whom the work is done.

The concluding section of the act is most interesting:

"The provisions of this Act shall have no application to any electrical work done or to be done in a home or building where such work is done or to be done by the owner himself or by some person of his family or who is in the general employ of said owner."

New Code To Be Ready This Month

Material for the 1925 National Electrical Code has been in the printer's hands for some weeks and is expected to be off the press during the month. Distribution will be made as soon as copies are available and it is hoped to have copies in the hands of all interested prior to September 1.

Southern California Electragists Take Up Merchandising Problems

Approximately two hundred people attended the first quarterly meeting of the California Electragists, Southern Division. Problems relating to merchandising, contracting and the details of handling the Red Seal Campaign absorbed most of the serious part of the program after which the entertainment committee took charge quite successfully.

After statements of the merchandising situation from several different angles by O. N. Robertson, Robertson Electric Company, Santa Ana; A. M. Fitch, Harrison-Fitch Electric Company, Pomona; D. D. McFarlane, Newberry Electric Company, Los Angeles; H. B. Harris, Listenwaller & Gough, Los Angeles and H. E. Holloway, San Diego Consolidated Gas & Electric Company, a committee of five was appointed to make a study of the problem, the appointments

were: C. A. Rowley, The McNally Company, Pasadena, chairman; Carl Heilbron, Southern Electric Company, San Diego; J. J. Farley, J. J. Farley Electric Company, Fullerton and Messrs. MacFarlane and Fitch previously mentioned.

O. N. Robertson was elected chairman of the merchandising section for the next year.

Members of other branches of the industry present congratulated the delegates on the formation of the California Electragists and a committee was appointed to draw up a resolution commending H. H. Walker, H. H. Walker Electric Company, Los Angeles and Clyde Chamblin, California Electrical Construction Company, San Francisco, for their unselfish service in the interest of the state organization.

The southern division was asked to nominate a president of the state association and Mr. Walker was unanimously selected.

Uniform Ordinance Well Received by Electrical Industry

Response to the distribution of the first copies of the Uniform Electrical Ordinance have been more than gratifying to the law committee of The Electrical Manufacturers Council which drew up the ordinance and is sponsoring its general adoption.

To date around six thousand copies have been distributed to electrical leagues, members of the Association of Electragists, jobbers and others and copies are now going out to the central stations and holding companies and members of the several inspection departments as rapidly as lists are compiled.

From all parts of the country the committee has received letters stating that the Model Ordinance filled a need that has long existed. In many places it will encourage those interested in modern methods to offer it as a substitute for existing worn out ordinances.

In twenty-five cities from which the committee has reports a new ordinance is in the process of being drawn up with the cooperation of the entire local elec-

trical industry. At the present time in most places such work is kept in suspense until the fall. In a couple of months the committee expects to find a much larger number of cities busily engaged in framing new ordinances.

Electrical Leagues Conference Planned for September

The Society for Electrical Development reports that the organization of the next conference of electrical leagues and clubs—Camp Co-operation V—to be held at Association Island, Henderson Harbor, N. Y., September 8 to 12, inclusive, is going ahead rapidly and from present indications will be an especially constructive meeting.

Among the subjects that will be included in the business program are the following: What leagues are doing; Planning the business program and financing a league; Managing league activities, etc. One of the league sessions will be devoted to woman's work in the electrical industry.

The conference itself will close with a banquet at which there will be several speakers of national prominence.

Brooklyn Contractors Hold Annual Outing

The annual outing of the Electrical Contractors of Brooklyn and Queens, N. Y., was held at Long Beach on July 22. This outing has virtually become an annual affair for the entire electrical industry of Brooklyn and Queens. The program included luncheon and dinner, sports, dancing and talks by prominent people. This year the occasion was unfortunately marred by very severe rains.

Denver League Elects Officers

The Electrical Co-operative League of Denver recently elected A. C. Cornell, manager of the Western Electric Company and one of the organizers of the league, as chairman. E. A. Scott of Scott Bros. Electric Co., and Dean D. Clark, of the Mountain States Telephone & Telegraph Company, were reelected secretary and treasurer respectively. The elections were declared unanimous following the report of the special nominating committee headed by John Cooper.

The contractors held individual meetings to designate their representatives on the board and the following were the selections: W. A. J. Guscott, E. C. Head-

rick, W. R. Kaffer, E. A. Scott and D. D. Sturgeon.

The first report on the subscription campaign for the new fiscal year was read and showed that 72 percent of the budget had been pledged up to July 6. S. W. Bishop, executive manager of the club advised that Tuesday, August 11, was the date selected on which to hold the annual picnic.

New Edition of Standard Documents

The fourth edition of the Standard Documents of the American Institute of Architects is now available at the office of the institute in Washington. The changes from the third edition are slight, the most important being in the Agreement.

A clause has been added relating to adjustment of agreed unit prices. A new article covers progress payments, formerly a part of Article 3, and also includes payment for material stored on the site. Final inspection and acceptance and the final payment, only partly covered the previous edition, are covered in the new edition in some detail.

There are a number of minor changes in the General Conditions. There appears to be no changes in the Acceptance of Subcontractor's Proposal or the Contract.

Chico Electragists Build Public Relations

THE public relations enjoyed by an electrical contractor are greatly enhanced when the public knows he belongs to the national organization of men engaged in that occupation. It gives him standing.

Such was the reasoning of the Chico, Calif., electrical contractors who, upon becoming members of the Association of Electragists recently, drew attention to the fact by the four column ten inch advertisement here reproduced.

Not only that but the local newspaper featured the new local branch in its news columns, telling of its purposes and its principles.

The public has come to expect that business men who belong to an association have higher ideals and this is em-

A. E. I. Vacations

The headquarters office of the Association of Electragists, 15 West 37th Street, New York City, will be closed as usual for two weeks on account of vacations, beginning August 16. All matters which are planned to be taken up with any members of the staff during that period must be handled either before August 16 or after September 1.

Since it has been found that this plan causes less disturbance in the work of the association than that of having one or several persons away from their work for two weeks at a time all through the summer, it has been decided to continue it in effect.

Louisville Electragist Has Severe Fire

The entire stock of the Theobald-Jansen Electric Co., Louisville, Ky., and two-thirds of its building were damaged by fire on July 1. Newspapers the day after the fire gave the loss at from \$60,000 to \$75,000. The company is reported to have been carrying a stock valued at approximately \$75,000 at the time.

The company is now operating in temporary quarters at 111 N. Fifth Street. Three firemen had narrow escapes from death and one clerk was slightly injured.

CALLING AN ELECTRICIAN MAY SAVE CALLING THE FIRE DEPARTMENT

Faulty electrical wiring and connections are responsible for many fires in the home; and it takes an EXPERT ELECTRICIAN to find and correct the faults.

Doctoring up your electrical equipment is like doctoring yourself. You may hit upon the right treatment—but if you don't, the results are disastrous.

Your electrical problems should be turned over to the man who thoroughly understands electricity. Your electrical wiring is safest in the hands of an EXPERIENCED ELECTRICIAN.

Better Electrical Work

REGULAR INSPECTION of wiring and equipment is an important FIRE PREVENTION measure. Calling an electrician may save calling the fire department.

What hands and feet are to a man, the electrical contractor is to the electrical industry; for his progress, the electrical contractor is indebted to leadership within his own group, and it is with pride your electrical contractors announce their membership and affiliation with the

INTERNATIONAL ASSOCIATION OF ELECTRAGISTS

We, the Chico members of the International Association of Electragists, are anxious to serve you with BETTER ELECTRICAL WORK.

Boblett Manufacturing Co.

432 Main Street

Gas & Electric Service Co.

323 Broadway



Bird Electric Co.

309 Main Street

Chico Electric Supply Co.

542 Broadway

phasized by the Chico electragists in their publicity under the name "Better Electrical Work."

Pittsburgh Association Swells Membership

The Electrical Contractors Association of Pittsburgh reports that it made a considerable gain in membership during the first half of the year and that now it has as members all of the principal firms in the city.

The association is taking an active interest in the revision of city wiring code which is being sponsored by the Allegheny County Board of Fire Underwriters and the Electrical League of Pittsburgh.

Wisconsin Association Plans Annual Outing

The annual outing of the Wisconsin State Association of Electrical Contractors and Dealers is announced for Saturday and Sunday, August 1 and 2, to be held at New London, Wis.

The party will leave Oshkosh Saturday morning in the ship, "Mayflower" and proceed up the Wolf River to New London where it will stay for the night, returning on Sunday.

Charles Krech, is chairman of the committee in charge and is assisted by L. W. Burch and Wm. Meter.

New York Independents Gather for Annual Outing

More than four hundred members and friends attended the twenty-first annual outing of the Independent Associated Electrical Contractor-Dealers of Greater New York, on July 11 at Oakwood Inn, Staten Island. The picture at the bottom of this page shows the group assembled on the lawn after the eatables had been consumed.

Much of the success of the afternoon was due to the entertainment committee headed by A. Lincoln Bush and includ-

ing, A. A. Tuna, Louis Freund, Harry A. Hanft, Alfred Whitley, S. J. O'Brien, H. M. Walter, I. Gaynor, Henry Fishback, Zoltann Hartman, Wm. D. Munro, Nathan Zolinsky and M. J. Heller.

Illinois Contractors' Association Revived

The local association at Bloomington, Ill., sent out a state wide call to contractors to meet in Bloomington on July 15. Seventy-five contractors from all over the state attended the meeting to discuss the effect of the new license bill and to prepare for application in the separate municipalities.

The meeting was opened by Guy Carlton, one of the old war horses of the old state association and a director in the national association some years ago. The chairman called on a number of the old guard such as, Charles Stapp of Peoria, E. E. Gibson of Decatur, W. J. Savidge of Macomb, John Hughes, James G. Gray of Bloomington, W. H. Jennings of Decatur, J. R. Downs of Peoria, J. E. Haenig of Springfield, also representatives of the Westinghouse Lamp Company, Diamond Electric Company, and Middle States Electric Company.

After the "glad to be heres" and "willing to cooperates" were properly recorded the matter of the state license bill was taken up and consumed most of the remaining time.

J. W. Collins, secretary of the Electrical Contractors Association of Chicago, explained the bill fully, answered questions as to scope and effect, and also gave the history of the pertinent events preceding the enactment of the bill.

After a two hour discussion and questioning, it was decided to form an active organization throughout the state to protect not only the interests of the contractors, but the entire industry.

Joseph R. Downs was elected president and L. B. Van Nuys was elected secretary and treasurer. The formulating of a constitution and by-laws was left in the hands of the officers elected, who were instructed to proceed at once and to send out a call for a general meeting to be held in Peoria the middle of August.

The contractors were taken care of very nicely by the Bloomington local association and no small amount of credit for arranging the meeting is due James G. Gray one of the local members, who compiled the list of invitations and sent out the call for the meeting.

Mississippi League Annual Convention

The annual convention of the Mississippi Electrical League was held at Gulfport, Miss., on July 27 and 28 on the porch of the Great Southern Hotel.

On Monday morning the address of welcome was scheduled to be made by the Mayor of Gulfport with the response being given by W. R. Herstein of New Orleans. C. E. Allen of St. Louis, Mo., was to speak on the "Future Development of the Electrical Industry" and H. M. Blain of New Orleans, La., on "Educating the Public."

The contractor-dealers divisional meeting was announced for the afternoon with W. F. Johnston, of the Dalton Electric Co., Meridian, Miss., in the chair. A general discussion of contractor-dealer problems was to follow with J. G. Fisher, inspector of the electrical department Mississippi State Rating Bureau talking on "Requirements of the National Electrical Code."

Tuesday morning was to be taken up with various talks by members with the afternoon being left free for sports, etc., culminating with a bathing party and luncheon at 6:00 p. m.



General Contractors Adopt Code of Ethics

How general contractors should deal with owners and the public, with engineers and architects and with sub-contractors and material suppliers is found in a code of ethics adopted this year by the Associated General Contractors and now available in booklet form.

Some of the rules are especially interesting to electrical contractors. Thus for instance on competitive bidding by general contractors the ethical practice is defined in seven paragraphs two of which are:

"1. Competitive bids preferably should be submitted only when a definite time and place for the opening of all proposals has been fixed, at which all bidders or their representatives are permitted to be present;

"2. The contractor's professional knowledge is the result of his training and experience and if he is called upon for preliminary estimates or appraisals it is proper that he should be paid in the same manner that engineers and architects are paid for similar service."

The ethical conduct of a general contractor towards subcontractors and material suppliers covers the practice most bitterly complained of by the electrical contractor—shopping of bids after bids have been opened. The code has the following to recommend on that point:

"1. Proposals should not be invited from any one who is unqualified to perform the proposed work or to render the proper service, or to whom, in event that his proposal should be the lowest received, the contractor would be willing to award the contract.

"2. The figures of one competitor shall not be made known to another before the award of the sub-contract, *nor should they be used by the contractor to secure a lower proposal from another bidder.*

"3. The contract should preferably be awarded to the lowest bidder if he is qualified to perform the contract, but if the award is made to another bidder, it should be at the amount of the latter's bid.

"4. In no case should the low bidder

be led to believe that a lower bid than his has been received.

"5. When the contractor has been paid by a client owner for work or material, he should make payment promptly, and in just proportion, to sub-contractors and others."

Winnipeg Contractor-Dealer Association Activities

AN interesting report upon conditions in Winnipeg that affect the electrical contractor-dealer industry is furnished THE ELECTRAGIST by S. F. Ricketts, secretary of the Winnipeg Electrical Contractor-Dealers Association and from it the following is quoted:

"Ordinances:—Winnipeg is so far in the lead with its ordinances that there is very little to be done along this line. We have a Canadian Bureau Code Committee however, which is working for standardization throughout Canada. Winnipeg has had an "All Metal" code for years. It may not be generally known that Winnipeg uses more power per capita and therefore is more heavily wired than any city in the world.

"Range Campaign Contracts:—The City Hydro has been working on a great range campaign during the year and has equipped hundreds of apartment flats as well as private houses with electric cooking. This work has been very slightly remunerative to the contractor due to the competition of the 'carpet bagger' was works for less than ordinary wages, and is encouraged by the policy of the City Hydro. When the city will award a contract for thousands of dollars to a man without even a 'shingle,' without capital and office, without responsibility, and the local jobber will accept progress certificate payments for his material, nothing can be hoped for by the legitimate contractor.

"The association has been working for better conditions and have been promised that at least the city fair wage clause will be lived up to, which requires certified payrolls to be submitted. Whereas Winnipeg electrical contracting business should be fairly good, considering the average amount of work being done, it is a fact that nobody makes any money. The contractor-dealer is not to blame, but is the 'goat' of the short sighted policy of long-term-payments instituted for cheap wiring and ranges by the public utilities. Whilst the contractor cannot keep his men employed those same men can go out and take contracts for wiring, and the jobber will then 'chase' them for their material orders. Surely we need a jobber's organization that will 'hang together' for the protection of themselves and the trade—but we haven't got one.

"Licensing Act:—The association is devoid of constructive action, for we have in sight a city licensing by-law which will take the place of a decrepit Provincial Act which aims to collect fees that are too meager to administer its act, which act seldom secures a prosecution, and is of no use for the purpose for which it was framed. Everybody is so terribly afraid in these days that somebody is going to do something in restraint of trade, that they tend to kill the trade so that it can't restrain.



The cure is so often worse than the complaint.

"Co-operative Advertising:—As a means of educating the public the association has taken a half page advertisement in the classified section of the telephone directory and, under the heading of 'The Public's Guarantee of Safety and Service,' and the association seal, has listed the membership of the association with their telephone numbers. Half the cost is being paid by the association and the members are assessed for the other half.

"Home Lighting Campaign:—From some member's point of view this was money wasted, but for the far seeing it had its educational value. Members put a lot of work and money into it; but failed to secure the co-operation of the school authorities, thereby lessening the results.

'Co-operation with Electragist Association:—We sent two delegates to the West Baden convention last year. Apart from the inspiration they themselves received and were able to re-transmit in part on their return, we have been guided by them in following up and discussing in our local meetings many of the papers written and reprinted from that convention. These papers have furnished instructive material for our meetings and we appreciate the kindness of THE ELECTRAGIST in supplying numerous copies on request. We hope to send two delegates down this year again.

"Red Seal Campaign:—So far we have not got under way with our Red Seal Campaign but it is not due so much to desire as to securing the means wherewith to finance it successfully. The scheme is in the hands of the Manitoba Electrical Association, co-operative with the Winnipeg Electrical Contractor-Dealers Association, and should go over this year.

"New Executives:—At the last meeting of the association the new executive committee for the year 1925-26 was elected and resulted in the following being appointed to take office at the annual dinner held on the second Thursday in September: E. T. Bubbs, E. T. Bubbs Electric Co., president; J. H. Schumacher, Schumacher-Gray Co., vice president; W. A. Straith, Western Elevator and Motor Co., Ltd.; W. Sibbald, Sibbald Electric Co.; T. Price, Electrical Contractor. At the joint executive meeting Fred Ball, Canadian Fairbanks-Morse Company, Ltd., was appointed

the new secretary-treasurer, to take the office left vacant by S. F. Ricketts of the Western Elevator and Motor Co., Ltd., who left for England on a three month's trip."

Nixon Named Secretary

Thomas W. Nixon, formerly with the Westinghouse Lamp Company, and at one time secretary of the Milwaukee electrical contractors, has been appointed secretary and field man of the Denver Electrical Contractors' Association, Inc., according to W. A. J. Guscott, president of the association.

Seattle Working On New Electrical Code

Seattle is working on a new electrical code which the committee expects will be ready in the early fall. The present code is now obsolete in many places and so the request of the building department to draw up a new code met with the approval of the city fathers.

Cooperating with the building department in this work is a committee having representation from all interests.

Kansas City Club Directors Meet

At the board of directors meeting of the Kansas City Electric Club held on June 22, the resignation of A. Penn Denton, as third vice-president in charge of the educational division of the club was announced in his compliance with his doctor's orders. Mr. Denton is a member of the Editorial Advisory Staff of THE ELECTRAGIST and will continue as a member of the board of the Kansas City club and act as chairman of its electrical code committee. He was succeeded by Herman C. Henrici.

The radio division, of which L. B. McCreary is chairman, is investigating the advisability of holding a radio show in the fall.

G. W. Weston, secretary-manager of the club announced that the usual luncheon meetings will be abandoned during the summer months and the next gathering will be held September 9 at the club rooms 904 Scarritt Building.

Wilkes-Barre Association to Hold Exposition

The Wilkes-Barre Electrical Association of Wilkes-Barre, Pa., has issued a folder announcing the 1925 electrical

exposition to be held October 12 to 17, at Irem Temple.

The folder states that it is the first exposition of its kind arranged in the Lehigh Valley and that it will contain demonstrations of the newest inventions and appliances in the electrical field.

Two of the features will be radio broadcasting and a real radio wedding.

Ambrose Saricks is secretary-treasurer of the association.

1925 Standard Code Approved as American

The 1925 edition of the National Electrical Code, which is shortly to be published by the National Board of Fire Underwriters, will announce on its title and cover pages its approval as an American Standard by the American Engineering Standards Committee. The first printing will be 100,000 copies.

New Chief Electrical Inspector for New York

George Sheridan, formerly in charge of the Motion Picture License Bureau of the City of New York was recently appointed Chief Electrical Inspector of the city to take the place of Hubert S. Wynkoop who died last December and who conducted the Code Chats in THE ELECTRAGIST.

Mr. Sheridan has been engaged in the electrical industry for over 42 years. He started as a lad with the F. Tucker Electrical Construction Company of New York and was with them for 27 years. In 1898 he became Chief Electrical Inspector of the Borough of Richmond, New York, and continued in that office until called to take up his duties with the motion picture bureau in 1918.

Washington to Have New Code

Electrical contractors operating in Washington are much pleased over the fact that the local Electric League has been asked to cooperate with District of Columbia authorities in the working out of a new Electrical Code for the national capital. The existing code is dated 1903 and no copies have been available for distribution for several years.

The league is now considering the plan of group organization and a committee is working on the necessary changes in the constitution and by-laws.

Electric Club of Seattle Is Progressive Body

"The Eighteenth Revolution of the R. P. M." the official organ of the Electric Club of Seattle, has just been issued and chronicles the doings of an especially active body of electrical men.

Chief among their recent activities was the "Electrical Wedding" under the auspices of the club and carried out at the Olympic Hotel with Miss Helen Clara Dines as the bride and John C. Carlson as the groom. The affair attracted considerable attention and prominently featured the giving of electrical gifts as wedding presents.

Preceding the ceremony a luncheon was held to which 800 guests sat down. The affair was broadcast over a local radio station and from a publicity standpoint was voted a great success. All committeemen were league members.

The official opening of the "Electrical Home" was held and attracted considerable attention to the subject of better wiring. The home will be given away in a coupon drawing contest together with other valuable prizes for the lucky number holders. A. J. Lutz is chairman of the committee in charge of the home campaign.

New Electragists

The following list of contractor-dealers have made application for membership and been accepted into the A. E. I. since the publication of the last list in the July issue:

CALIFORNIA

Chico:
Chico Elec. Supply Co.

MASSACHUSETTS

Wollaston:
Frank A. Jenness.

MINNESOTA

Biwabik:
Biwabik Elec. Serv. Co.

Eveleth:
Eveleth Elec. Serv. Co.
Zenith Electric Co.

Hibbing:
Wallene Electric Co.

Rochester:
A. H. Foster Elec. Co.

St. Cloud:
Granite City Elec. Co.
L. M. Grosse Elec. Co.

Virginia:
Whiting Electric Co.
Carl B. Larson.

NEW YORK

Binghamton:
George H. Steffens.

Johnson City:
John L. Beurket.

Rochester:
John E. Powers.
Adams Electric Co.

Schenectady:
Edward Kenitz.
Rogers & Abbe.

Syracuse:
L. W. Kieseewetter.

Utica:
Worden Elec. Co., Inc.

NORTH CAROLINA

Lenoir:
Bradley Electric Co.

NORTH DAKOTA

Fargo:
Fargo Plbg. & Electric Co.

SOUTH DAKOTA

Chamberlain:
National Electric Co.

Huron:
Electric Service Co.

Pierre:
Pierre Hardware & Elec. Co.

Rapid City:
Bert Galbaugh Elec. Shop.

Sioux Falls:
C. C. Riley Elec. Co.
Smith Phonograph & Elec. Co.
Pryde Electric Co.
George E. Wheeler.

CANADA

Winnipeg, Manitoba:
Ernest Bubbs & Company.
Elmwood Electric Co.

News Notes Concerning Electrical Contractor-Dealers

The Independent Electric Company of Watsonville, Cal., has moved to larger quarters in the Weeks Building.

An electrical business specializing in contracting has been opened in Kenton, Ohio, on South Detroit Street, by Aaron Smith.

The Schutzer Electric Supply Company, formerly located at 408 Ferry Street, Pittsburgh, Pa., has moved to larger quarters at 437 Liberty Avenue.

The M & A Electric Company of Gadsen, Ala., has moved to larger quarters at 540 Broad Street.

G. E. Bliss & Company of Florence Street, Malden, Mass., are moving to a new location in the Caldwell Building.

C. H. Brown and William Tucker have opened an appliance business in the Knupp Building, Portersville, Cal.

The Julian Electric Company of Richmond, Va., has recently moved to 1805 East Main Street.

Frank Carroll and Dan Searle have opened an electrical appliance store at 354 Pacific Avenue, Santa Cruz, Cal.

The King-Russell Electric Company, composed of Ted Russell and Lewis King, has recently opened a combined contractor and dealer business at Third and San Fernando Streets, San Jose, Cal.

An electrical shop has been opened in Morris, Ill., by James Steward at 607 North Liberty Street.

The Caywood Electric Company of Houston, Texas, has just opened a store at Main Street and Hadley Avenue.

Zoltann Hartmann, financial secretary of the New York I. A. E. C. D., has recently purchased his own building to house his business at 1051 Hall Place, Bronx, New York.

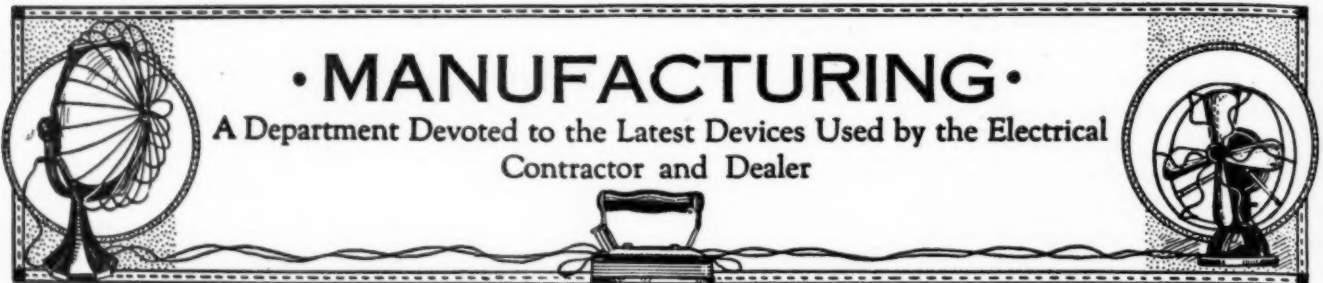
Louis Freund, 23 West 31st Street, New York City announces the removal of his business to newer and larger quarters and showrooms at 116 West 31st Street, New York.

James M. Gillooly, formerly conducting an electrical contracting business at 570 Liberty Street, Springfield, Mass., has opened an establishment at 51½ Taylor Street, under the name of the Springfield Electric Company.

Delbert Hitchcock of Millersburg, Ohio, has sold his electrical store and business to J. L. Kennedy, who has taken possession and has changed the name to the Kennedy Electric.

B. F. Yoast of Huntington Park, California, has bought the electrical contracting business of Burton and Ludt at 838 East Florence St., Bell, Calif.

The G. T. Bryce Plumbing & Heating Co., of West Evans Street, Florence, S. C., has purchased the business of the Fortner Electric Company of that city and will operate it hereafter as one of the departments of the business.



Box Receptacles

Pass & Seymour, Inc., Solvay Station, Syracuse, New York, are placing on the market, a special new device for old house work where loom boxes and the BX type of surface boxes are used frequently.

These devices with short chain and cord, insulated chain and the keyless type, are all fitted with a 2 $\frac{1}{4}$ -in. porcelain shade holder. The deep recessed back is 5 5-16-in. in diameter with a recess 4 $\frac{1}{4}$ -in. wide and 1 $\frac{1}{4}$ -in. deep.



The manufacturers claim that these devices may also be used for switch boxes, for 3 $\frac{1}{4}$ -in. and 4-in. outlet boxes, whether mounted flush with the surface or extending from the wall an inch or more.

The devices are snow white, highly vitrified porcelain, with a deep crystal glaze and are large enough to harmonize perfectly with the half-shade or deep shade type of glassware. This type of device is almost universal in its application throughout the house. The ease of cleaning is a feature and the shade holder cannot rust, tarnish or lose its lustre.

Junction Condulets

The Crouse Hinds Company, of Syracuse, New York, has issued an illustrated folder describing the line of screw cover junction condulets that the company started manufacturing a short time ago. They are listed in bulletins No. 2068 and 2076.

The condulets come in two diameters; 2 $\frac{1}{2}$ in. and 3 $\frac{1}{2}$ in., the larger ones only taking connection blocks which are provided in 2, 3 and 4 wire sizes. The folder states that the condulets are made of cast iron; while the covers are made of cast brass and threaded, in order to insure a tight fit. The covers are provided with two bosses which permit the use of a wrench, screw driver, or bar for turning. They are of ample dimensions and provide space for taps, and for the passage of additional circuits.

New Motor Starter

A new motor starting switch for use with time limit protective cutouts has just been brought out by the Square D Company, Detroit, Michigan.

The switch can be used with motors of three horsepower and below on 110 volts, and with motors rated above three horsepower up to and including five horsepower on 220 volts.



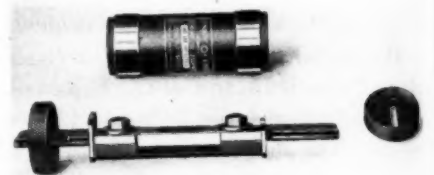
The design of the switch is very compact which makes it possible to use a small switch cabinet. It can be mounted on small machines or in locations where the space is limited.

The switch cabinet is finished with baked enamel and a latch is provided for sealing the switch cover shut. The switch can also be locked into the off position.

Ends of the cabinet are equipped with a large number of different sized knockouts.

Renewable Fuse

A renewable fuse of the knife blade type that embodies several modifications of their line of "Union" renewable fuses has recently been placed on the market by the Chicago Fuse Co., of Chicago.



The illustration shows the details of design and construction. The makers state that all that is necessary to disassemble the fuse is to unscrew the two caps, and then slip out the entire knife blade member after one end of it has been shifted slightly to get it out of its locked position. One of the caps can be removed, but the other is held on the knife blade by two nibs. Heavy grey horn fibre is used in the construction of the case and the knife blade member consists of two sections of flat copper which are connected by a fibre bar. The new fuses are made in all standard ratings—from 65 to 600 amp., 250 or 600 volts.

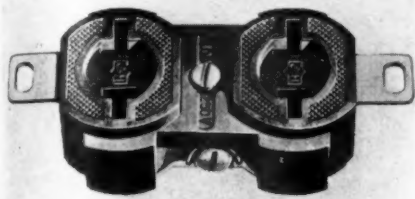
Rawlplugs

The Rawlplug Co., Inc., of 66 West Broadway, New York, announces that their own factory for the manufacture of Rawlplugs is now in operation in New York City and the product will be available in a greater range of sizes, etc., than heretofore, when all production was centered in England.

A message from the company states that "the fibre screw anchor that holds screws fast" as they call it, will be put up in attractive stock display cases together with a complete line of Rawl-drills and will soon be offered to the retail dealer.

New C-H Flush Receptacles

New single and double flush receptacles have recently been added to the C-H wiring device line of The Cutler-Hammer Mfg. Co., of Milwaukee.



They are small and shallow, made of C-H thermoplas cold moulded insulation, convenient for wiring and installation. They have T-slots for accommodating standard attaching caps and are rated at 10A, 250V. The catalog numbers are 7910 for the single receptacle and 7920 for the duplex, shown here.

Brandes Transformer

In this section of last month's issue it was erroneously stated that the new type of transformer being manufactured by C. Brandes Inc., of 200 Mt. Pleasant Ave., Newark, N. J., amplified frequencies of from 200 to 4000 cycles per minute. This should have read 200 to 4000 cycles per second. The company desires it known that the transformer is so designed that two stages of amplification may be employed without sacrificing quality of reproduction, also that the amplification is without distortion.

Lighting Unit

The Consolidated Lamp and Glass Company of Coraopolis, Pa., announces the manufacture of a new series of lighting glassware, identified at the 2354 line.



The series includes globes of 10, 12, 14, and 16 inches diameter, in white or cased glass, and plain or with either

of two styles of decoration, one of which is shown here.

The manufacturer claims an advantageous distribution of light for this design, tests revealing almost 62 percent of the light within the zone 0 degrees to 90 degrees, and over 36½ percent within the zone 0 degrees to 60 degrees.

Reflectors

Four new types of show window reflectors are being placed on the market by Curtis Lighting, Inc., of Chicago, which claims that they are designed on principles that make new advances in illumination and are adaptable to every show window lighting requirement.

Two of the new reflectors, "Jack" and "Jill," use 150 watt lamps. "Jack" shown here is a high trim reflector for deep windows.



"Jill" is a low trim reflector of the same lamp size that gives a semi-concentrating light. Its system of corrugations break up and redirect the light rays in a uniform distribution. Both types may also be used with 100 watt lamps.

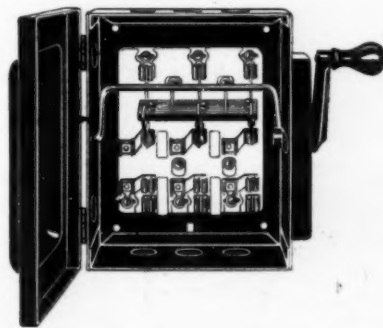
Two other new reflectors, "King" and "Queen" use 200 watt lamps. "King" is a distributing type reflector for use in large deep windows that have a high trim. "Queen" is a semi-concentrating type for use in shallow windows.

Motor Starting Switch

A new type of motor starting switch is announced by the Wadsworth Electric Mfg. Co., of Covington, Ky., in their supplement No. 1.

The special features claimed for it are that there are only six connections to make, three on line and three on load; that it can be thrown from starting position to neutral position without going into running position, and that

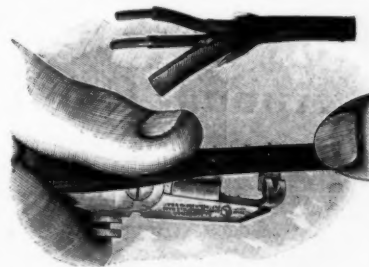
there are no springs on inside of the cabinet to crystalize, break or fall across the live contacts, causing short circuits, damage to the switch and probable injury to the operator.



The inside dimensions are 7¼ in. wide, 9 in. high and 4 in. deep. Ample wiring space permits of rapid installation. Adequate knockouts are provided at top, bottom and left side of cabinet. It is finished in baked enamel with drawn cabinet.

Cord and Wire Stripper

A wire stripper that the manufacturer states avoids the cutting and loss of any of the strands of wire as occurs through the use of a knife, and that does the stripping in one motion, is being manufactured by A. Laubscher, 77 Fort Pleasant Avenue, Springfield, Mass., and is known as the Acme Electric Cord and Wire Stripper.

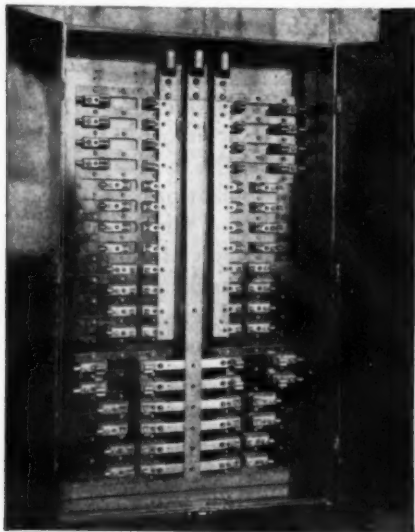


By means of a set screw it is possible to set the stripping opening to whatever size is necessary to accommodate the wire to be stripped. The instrument is provided also on the side with wire cutting jaws and a projecting knife for slitting braided coverings or heater cords and on heavy reinforced wire.

All parts are interchangeable and the cutting blades are attached to the jaws with specially made shoulder screws, counter-sunk into the jaws, the cutting edges being ground to a perfect fit. If a blade is broken or damaged it can be unscrewed and replaced by another procured from a dealer or the manufacturer.

Grouped Phase Power Panel

The Square D Company of Detroit, Mich., has placed on the market a new type of power panel, that in addition to providing construction which makes it possible to use either 30, 60 or 100 amp. fuses in each circuit, is arranged so that all of the fuses of one phase are placed in one group.



This arrangement of fuses, the manufacturers claim, make it impossible to short circuit while re-fusing because of the fact that all of the poles within range of the fuses will be of the same polarity. Each pole in the circuit is

given a number so that it is easy to distinguish the specific circuit.

The phases are placed in the cabinet so that the main lugs can be grouped at the top of the cabinet, and the main lines can be brought in at one point.

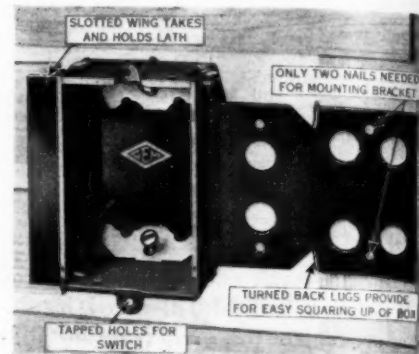
Condensed Notes of Interest to the Trade

J. E. Lowrey has been appointed sales manager and is in charge of the new supply distributing house erected by the Western Electric Company at San Antonio, Tex.

The Square D Company of Detroit, Mich., announces the following changes in its personnel: E. W. Chapman formerly district sales manager in the Detroit district has been appointed assistant sales manager of the company; J. J. Mitchell who has been district sales manager of the St. Louis district has been made district sales manager of the Pittsburgh district; T. R. Gano, former Pittsburgh district sales manager has been transferred to the Detroit district as district sales manager; H. N. Foster has been made St. Louis district sales manager and Howard D. Fearey has been placed in charge of the Portland, Ore., territory succeeding H. R. Drew, who has resigned.

Sectional Switch Boxes

Chicago Fuse Mfg. Co., of Chicago, has placed on the market new Gem sectional switch boxes.



In place of being screwed to cross members, which have to be nailed to adjacent studs, this new type of box has a mounting bracket on one side which, as shown in the illustration, is simply nailed to the stud. On the opposite side is a slotted wing which accommodates the lath. The boxes are standard Gem construction made in three styles, one for flexible loom, one for armored conductor, and the third for conduit.

Electric Ranges

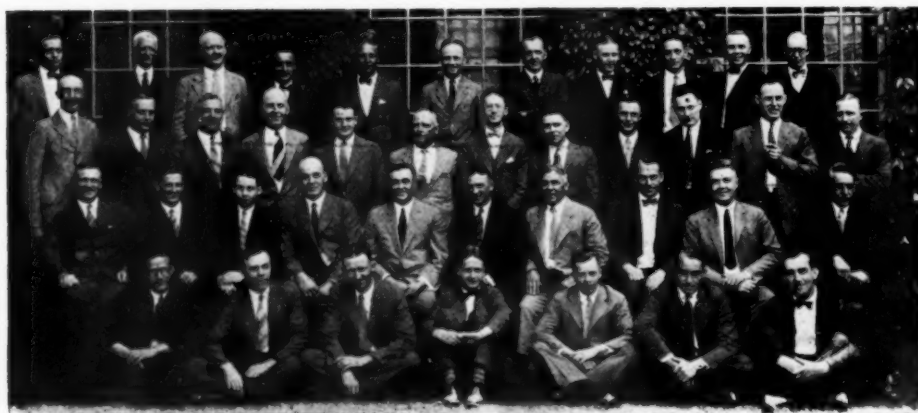
The Simplex Electric Heating Company of Cambridge, Mass., has brought out a new line of full enamelled electric ranges, type No. 82, of which is shown below.



The manufacturers state that all parts of the new ranges were designed to be made from special enamelled steel stock, no castings being used, and in this way a tough porcelain enamel is produced that can be delivered into a customer's kitchen without being chipped.

Nuts and bolts bearing on enamelled surfaces have been eliminated. All heating units are the same type as have been used in previous Simplex ranges. They are made in three styles, either left or right hand, and are finished in gray with white doors, panels and splashers.

Arrow Salesmen Who Met in June for Annual Conference at Hartford



Reading from left to right, bottom row: Mr. S. A. Griswold, Hartford, Mr. J. G. Gurling, Hartford, Mr. C. H. Wilmot, Hartford, Mr. F. R. Shields, Hartford, Mr. A. F. Schwolow, New Haven, Mr. G. C. Griffith, Hartford, Mr. J. W. Connelly, Hartford.

Second row: Mr. F. Alley, Hartford, Mr. R. S. Hurd, Hartford, Mr. N. P. Belcourt, Hartford, Mr. R. L. Wildauer, Chicago, Mr. E. R. Grier, Hartford, Mr. A. C. Nelson, Boston, Mr. S. B. Gregory, San Francisco, Mr. G. R. Wentworth, Syracuse, Mr. J. Searls, St. Louis, Mr. W. H. Green, Baltimore.

Third row: Mr. H. P. Humphrey, Washington, N. J., Mr. A. P. Deacon, New York, Mr. F. S. Peck, Boston, Mr. C. J. Henry, Detroit, Mr. A. H. Hardy, Chicago, Mr. C. A. Ten Eyck, Hartford, Mr. E. B. Grier, Hartford, Mr. J. J. McCoy, Pittsburgh, Mr. C. H. Durant, New York, Mr. J. D. Springett, New York, Mr. E. F. Webster, New York, Mr. A. W. Bevin, Hartford.

Top row: Mr. M. F. Green, Baltimore, Mr. W. F. Taylor, Hartford, Mr. A. H. Nero, Hartford, Mr. J. E. Roberts, Seattle, Mr. H. C. Pond, Hartford, Mr. P. K. Murdock, New York, Mr. B. C. Perkins, Hartford, Mr. H. Bloom, Chicago, Mr. P. Ramsey, Atlanta, Mr. E. J. Smith, Syracuse, Mr. W. H. Harrington, Hartford.